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Old
Series,
Vol. XXX

CONTINUATION OF THE
BULLETIN OF THE NUTTALL ORNITHOLOGICAL CLUB

New
Series,
Vol. XXII

The Auk

A Quarterly Journal of Ornithology

Vol. XXII — JANUARY, 1905 —

No. 1



PUBLISHED BY

The American Ornithologists' Union

CAMBRIDGE, MASS.

Entered as second-class mail matter in the Post Office at Boston, Mass.

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'THE AUK,' published quarterly as the Organ of the AMERICAN ORNITHOLOGISTS' UNION, is edited by Dr. J. A. ALLEN, with the assistance of Mr. FRANK M. CHAPMAN.

TERMS:—\$3.00 a year, including postage, strictly in advance. Single numbers, 75 cents. Free to Honorary Fellows, and to Fellows, Members, and Associates of the A. O. U. not in arrears for dues.

Subscriptions should be addressed to DR. JONATHAN DWIGHT, Jr., Business Manager, 2 EAST 34TH ST., NEW YORK, N. Y. Foreign Subscribers may obtain 'THE AUK' through R. H. PORTER, 7 PRINCES STREET, CAVENDISH SQUARE, W., LONDON.

All articles and communications intended for publication and all books and publications for notice, should be sent to Dr. J. A. ALLEN, AMERICAN MUSEUM OF NATURAL HISTORY, 77TH ST. AND CENTRAL PARK, WEST, NEW YORK CITY.

Manuscripts for general articles should reach the editor at least six weeks before the date of the number for which they are intended, and manuscripts for 'General Notes' and 'Recent Literature' not later than the first of the month preceding the date of the number in which it is desired they shall appear.

OLD SERIES, }
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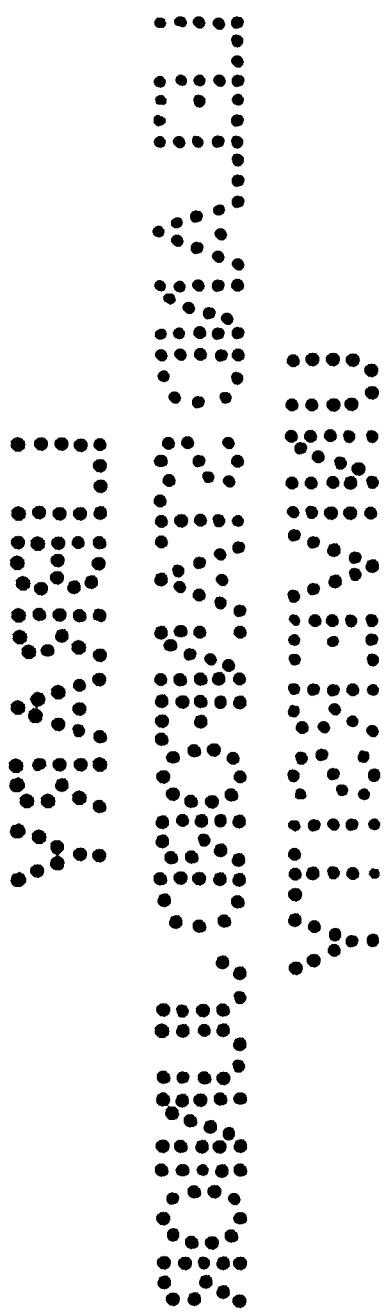
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THE AUK:

A QUARTERLY JOURNAL OF ORNITHOLOGY.

VOL. XXII.

JANUARY, 1905.

No. 1.

ROUTES OF BIRD MIGRATION.

BY WELLS W. COOKE.

I. MIGRATION ROUTE FROM MEXICO TO TEXAS BY WATER.

THROUGHOUT the broad expanse of level land between the Allegheny and the Rocky Mountains, bird migration is so uniform that a species is expected always to appear first at the more southern localities. An apparent exception to this rule is noted in the case of several species whose recorded dates of spring arrival in northern Texas are earlier than the corresponding dates many miles to the southward.

Thus the first Black and White Warblers (*Mniotilta varia*) were seen near Corpus Christi March 21 (average of five years), near San Antonio March 15 (average of seven years), and in northeastern Texas March 13 (average of four years). The distance from Corpus Christi to latitude 33° in northern Texas is 350 miles, a distance that ordinarily is passed over by the Black and White Warbler in about 17 days, since its average rate of travel in the Mississippi Valley is not far from 20 miles per day. This species therefore arrives in northern Texas some three weeks earlier than would be expected from the records of its spring appearance in southern Texas. The records for ten years give March 21 as the average date of arrival of the Parula Warbler (*Compsothlypis americana*) at San Antonio, while the corresponding date 300 miles farther north is March 14.

A probable explanation of such sets of records is that these early birds in northeastern Texas, have reached the northeastern coast of Texas by a flight across the Gulf of Mexico, and this long journey, performed in a single night, has carried them north earlier than their fellows which reach southern Texas by a slow land journey from Mexico.

The Worm-eating Warbler (*Helmitheros vermivorus*) is a not uncommon migrant in northeastern Texas and is well-known as a winter resident of eastern Mexico, north to Alta Mira. But this species is unknown in southern Texas, though the region from Corpus Christi to the Rio Grande has been carefully searched by competent ornithologists. Here then the birds apparently fly over water to northeastern Texas from the coast of the Gulf of Campeche, though the distance to their destination by land through northern Mexico and southern Texas would be but slightly longer. Evidently the birds do not shun a long trip over water.

The Chestnut-sided Warbler (*Dendroica pensylvanica*) is not uncommon along the whole coast of Texas, but is almost unknown in Mexico; the Mourning Warbler (*Geothlypis philadelphia*) is as common on the coast of Texas as anywhere in the United States, but has no certain record for Mexico; the Green-crested Flycatcher (*Empidonax virescens*) breeds in eastern Texas to Corpus Christi, and is known as a migrant south to the Rio Grande, but has only one record in Mexico west of Yucatan; the Red-eyed Vireo (*Vireo olivaceus*) is common in eastern Texas south to Corpus Christi, then its numbers become rapidly less, until south of the Rio Grande it has been but twice recorded west of Yucatan. Such records seem to show conclusively that the larger portion of the birds of these species reach the northeastern coast of Texas by a flight across the Gulf of Mexico.

The above remarks show three different kinds of records, each of which leads to the conclusion that some individuals of the species fly across the Gulf of Mexico to northeastern Texas. More or less strong reasons of a similar nature exist for believing that some individuals of each of the following species, use this same migration route.

Migration Route from Mexico to Texas by Water.

Kingbird (*Tryannus tryannus*).
 Green-crested Flycatcher (*Empidonax virescens*).
 Bobolink (*Dolichonyx oryzivorus*).
 Scarlet Tanager (*Piranga erythromelas*).
 Red-eyed Vireo (*Vireo olivaceus*).
 Black and White Warbler (*Mniotilta varia*).
 Prothonotary Warbler (*Protonotaria citrea*).
 Worm-eating Warbler (*Helmitheros vermivorus*).
 Golden-winged Warbler (*Helminthophila chrysoptera*).
 Parula Warbler (*Compsothlypis americana* subsp. ?).
 Cerulean Warbler (*Dendroica cerulea*).
 Chestnut-sided Warbler (*Dendroica pensylvanica*).
 Bay-breasted Warbler (*Dendroica castanea*).
 Kentucky Warbler (*Geothlypis formosa*).
 Mourning Warbler (*Geothlypis philadelphia*).
 Wilson Thrush (*Hylocichla fuscescens*).
 Gray-cheeked Thrush (*Hylocichla aliciae*).

II. MIGRATION ROUTE BETWEEN FLORIDA AND YUCATAN.

The senior editor of 'The Auk' in reviewing my paper on 'Some new Facts about the Migration of Birds' makes this statement in regard to the routes of migration across the Gulf of Mexico: "It would be interesting to know to what extent some of these generalizations rest on negative evidence, for stations along the eastern coast of Mexico, including Yucatan, where observations have been made bearing on the migration of birds are certainly few and far between, and cover only short periods."

The paper in question did not seem the proper place for presenting the original data that served as the basis for these statements. These data are now given that each one may judge for himself as to the correctness of the conclusions.

As a preliminary it may be stated that the dates of spring arrival in Louisiana and Mississippi are, for most species, earlier than the time at which these same species appear in northern Florida and northern Texas. This seems conclusive evidence that the Louisiana and Mississippi birds reach the United States by a flight across the Gulf of Mexico. Indeed, except in the case

of the Swallows, there is no evidence to show that any birds migrate to the mouth of the Mississippi overland by way of Florida or Texas.

The Yellow Warbler (*Dendroica aestiva*) is one of the most common breeders throughout eastern North America, from the limit of tree growth in the north to central Georgia. Then to the southeast its numbers rapidly diminish, the species is practically unknown in Florida in spring migration and the numbers that occur in that State in the fall are but a tithe of those found to the north and west. The Yellow Warbler is a common migrant in eastern Mexico, especially in Yucatan and the islands off its east coast, but no farther east. It is unknown in Cuba or any other of the islands of the Greater Antilles and the avifauna of these islands has been sufficiently studied so that it is certain that this species can exist on them, if at all, only as a rare straggler.

A line drawn from Savannah, Ga., to the islands off the east coast of Yucatan marks approximately the eastern edge of the district in which the Yellow Warbler is common,—to the westward ubiquitous, to the eastward scarcely known. While no one has tagged a Yellow Warbler in the Carolinas and captured that same individual in Yucatan, it is a stretch of the imagination not to believe that the Yellow Warblers of the eastern United States pass in fall southwest, following the general trend of the Atlantic Coast, and continue this same direction to Yucatan. It is certain that they cross the Gulf of Mexico; it is unlikely that they take any unusual course when the shortest and most direct offers congenial conditions.

The case of the Yellow Warbler has been given in full because it is one of the commonest and best known species. The line of reasoning is just the same for a number of other species that are common in eastern United States and in Yucatan, but are rare or unknown in southern Florida, Cuba, and the other West Indies.

It is not meant, of course, that no individual of these species ever passes through Florida to Cuba and on thence to Central or South America. But what is meant is that the avifauna of Florida and Cuba has been so thoroughly studied for so long a period that the failure to find these species there except as stragglers is proof positive that the large majority of the individuals choose some other migration route.

Kingbird (*Tyrannus tyrannus*).
 Wood Pewee (*Contopus virens*).
 Green-crested Flycatcher (*Empidonax virescens*).
 Orchard Oriole (*Icterus spurius*).
 Rose-breasted Grosbeak (*Zamelodia ludoviciana*).
 Blue Grosbeak (*Guiraca cærulea*).
 Indigo Bunting (*Cyanospiza cyanea*).
 Dickcissel (*Spiza americana*).
 Purple Martin (*Progne subis*).
 Red-eyed Vireo (*Vireo olivaceus*).
 Blue-headed Vireo (*Vireo solitarius*).
 Yellow Warbler (*Dendroica æstiva*).
 Magnolia Warbler (*Dendroica maculosa*).
 Black-throated Green Warbler (*Dendroica virens*).
 Hooded Warbler (*Wilsonia mitrata*).
 Olive-backed Thrush (*Hylocichla ustulata swainsoni*).

All of these sixteen species pass on south and southeast to South America or proceed at least as far in that direction as Panama.

In addition to these, there are several other species that are common in the eastern United States and migrate across the Gulf of Mexico to Central America and continue to South America or Panama, avoiding southern Florida and the West Indies, but at the same time they are not yet known to occur both on the northeastern coast of the Gulf of Mexico and regularly in Yucatan, so that they can be included in the preceding list. Their routes of migration will be discussed later in this article. For the present it is sufficient to enumerate them :

Nighthawk (*Chordeiles virginianus*).
 Crested Flycatcher (*Myiarchus crinitus*).
 Olive-sided Flycatcher (*Nuttallornis borealis*).
 Yellow-bellied Flycatcher (*Empidonax flaviventris*).
 Alder Flycatcher (*Empidonax trailli alnorum*).
 Least Flycatcher (*Empidonax minimus*).
 Baltimore Oriole (*Icterus galbula*).
 Scarlet Tanager (*Piranga erythromelas*).
 Cliff Swallow (*Petrochelidon lunifrons*).
 Philadelphia Vireo (*Vireo philadelphicus*).
 Prothonotary Warbler (*Protonotaria citrea*).
 Blue-winged Warbler (*Helminthophila pinus*).
 Golden-winged Warbler (*Helminthophila chrysoptera*).
 Tennessee Warbler (*Helminthophila peregrina*).

Cerulean Warbler (*Dendroica cerulea*).
 Chestnut-sided Warbler (*Dendroica pensylvanica*).
 Bay-breasted Warbler (*Dendroica castanea*).
 Blackburnian Warbler (*Dendroica blackburniæ*).
 Kentucky Warbler (*Geothlypis formosa*).
 Mourning Warbler (*Geothlypis philadelphia*).
 Wilson Warbler (*Wilsonia pusilla*).
 Canadian Warbler (*Wilsonia canadensis*).

The two lists together present thirty-eight species that regularly pass from the eastern United States to South America or Panama, avoiding the West Indies.

Certain species occur in the eastern United States and in the West Indies, but are known so rarely in Yucatan and adjacent parts of Central America as to make it practically certain that the species as a whole passes to South America by way of the West Indies. Among these are :

Yellow-billed Cuckoo (*Coccyzus americanus*).
 Chuck-will's-widow (*Antrostomus carolinensis*).
 Florida Nighthawk (*Chordeiles virginianus chapmani*).
 Gray Kingbird (*Tyrannus dominicensis*).
 Bobolink (*Dolichonyx oryzivorus*).
 Black-whiskered Vireo (*Vireo calidris barbatulus*).
 Black-throated Blue Warbler (*Dendroica cærulescens*).
 Black-poll Warbler (*Dendroica striata*).
 Connecticut Warbler (*Geothlypis agilis*).

To South America via the Bahamas :

Gray-cheeked Thrush (*Hylocichla aliciaæ*).

In addition to the above-mentioned species there are eighteen species from the eastern United States that pass in winter to South America or Panama. The Mangrove Cuckoo (*Coccyzus minor*) is resident throughout so much of its range in the West Indies, Central and South America that no migration route for it can be outlined. At the present, there seem to be no data to prove or indicate that the Kingfisher (*Ceryle alcyon*), the Barn Swallow (*Hirundo erythrogastra*), the Bank Swallow (*Riparia riparia*) and the Cedar Waxwing (*Ampelis cedrorum*) ever cross the Gulf of Mexico. It is practically certain that some Black-billed Cuckoos (*Coccyzus erythrophthalmus*) from the eastern United States pass

across the West Indies, and it is equally probable that the individuals from the Mississippi Valley cross the Gulf of Mexico and reach South America by way of Central America. The Wilson Thrush (*Hylocichla fuscescens*) is unknown in migration east or west of a narrow belt extending north and south between central Cuba and Yucatan and thence southeast to South America.

There remain the following eleven wide-ranging species that winter both in the West Indies and in Central America and pass south to South America or to Panama.

- Painted Bunting (*Cyanospiza ciris*).
- Yellow-throated Vireo (*Vireo flavifrons*).
- Black and White Warbler (*Mniotilta varia*).
- Worm-eating Warbler (*Helminthos vermivorus*).
- Myrtle Warbler (*Dendroica coronata*).
- Oven-bird (*Seiurus aurocapillus*).
- Water-Thrush (*Seiurus noveboracensis*).
- Louisiana Water-Thrush (*Seiurus motacilla*).
- Northern Yellow-throat (*Geothlypis trichas brachidactyla*).
- American Redstart (*Setophaga ruticilla*).
- Catbird (*Galeoscoptes carolinensis*).

The above tables may be recapitulated as follows :

Species from the Eastern United States that range to South America or Panama.

That cross from Florida to Yucatan	16
That cross the Gulf of Mexico on their way from the Southeastern United States to Central America	22
That cross the West Indies	10
Whose migration route is unknown or not classified	7
Wide-ranging species	11
<hr/>	
Total	66

The above summary makes clear the facts that the large majority of land birds from the eastern United States bound for South America, cross the Gulf of Mexico in preference to journeying via the West Indies or by Florida and Cuba ; and that hardly a sixth of these species are known to reach South America across the West Indies. It is believed that the facts here presented justify the statement: "The main traveled highway is that which stretches

from northwestern Florida across the Gulf, continuing the southwest direction which most of the birds of the Atlantic coast follow in passing to Florida."

But it is probable that the case is stronger than so far stated. If one will study the distribution and migration of birds around the Gulf of Mexico, he will come to believe in what I call 'parallels of migration.' There is no single fact or series of facts that proves this, but many facts are explained by it that are difficult to explain otherwise. An example will show what I mean by parallels of migration. The western edge of the regular range of the Kingbird (*Tyrannus tyrannus*) extends from Corpus Christi, Texas, to the State of Tabasco in Mexico; the eastern edge from Florida to Yucatan. The whole path of migration crosses the Gulf of Mexico. It is a fair presumption that the individuals that are farthest west in Texas are the ones that fly to Tabasco, and that the Yucatan Kingbirds come from Florida. Between Florida and Texas, it is practically certain that the Kingbirds in the fall, as they reach the coast of the Gulf of Mexico from the north, launch out across the Gulf from the place where they came to the coast, without migrating either east or west along the north coast before undertaking their water flight. Thus each Kingbird starts across the Gulf in an approximately southerly direction and so their lines of migration across the Gulf are approximately parallel.

As already stated, this theory is not at present susceptible of proof, but it seems the most reasonable explanation of the known facts. It is not meant that all the individuals of a species follow these parallel lines, because it is known that there are wanderers, from choice or accident, in most species, but that these parallels represent the normal and usual lines of flight of the larger portion of the species.

If this theory of parallels of migration is correct, then it follows that, in the case of a wide ranging species, like the Black and White Warbler, occurring in the Bahamas, Cuba, Yucatan and most of Mexico, the individuals from eastern Florida probably pass to the Bahamas, from central Florida to Cuba, from northwestern Florida to Yucatan, from the mouth of the Mississippi southward across the Gulf, and from central Texas to Mexico by land.

It is a well-known fact, that it is the individuals from the eastern United States, rather than from the western United States, that pass to South America. When a species is so variable that the eastern individuals can be distinguished from the western, it is found in most cases that the individuals wintering in South America are similar to those of the eastern United States, while those from the western United States winter in Mexico and Central America. Since then it has already been shown that few species or individuals pass through the West Indies to reach South America, it follows that the individuals that pass to South America are for the most part those that have flown across the Gulf of Mexico.

If the above reasoning is correct, then the eleven species given in the preceding list as 'wide ranging species', can be added to those that cross the Gulf of Mexico on their way to South America or Panama. The recapitulation would then stand:—

Species that reach South America or Panama	
by way of the West Indies	10
by an unknown route	7
by way of the Gulf of Mexico	49
<hr/>	
Total	66

In other words, it is practically certain that 60 per cent — more probably at least 75 per cent — of the species of land birds from the eastern United States that winter in South America or Panama, take a flight across the Gulf of Mexico on the way to their winter home.

III. INFERENCEAL MIGRATION ROUTES.

The following supposed migration routes are based largely on negative evidence, that is, on the absence of proof that the species use other routes. Thus, for instance, in the case of the Canadian Warbler, it is a common bird of the northeastern United States and breeds in the mountains south to North Carolina; it is practically unknown in Honduras, Yucatan, the West Indies, Florida, South Carolina, Georgia, and Alabama; but it is known in eastern Mexico and Guatemala, whence it proceeds through Central America to its winter home in South America. There are so

many thousands of these birds in the northeastern United States that they could not all pass through the Gulf States unnoticed, and so one is led to believe that having passed to the southern end of the mountains, they start at once on their journey across the Gulf, flying *over* the Gulf States. Since they are also unknown in the lower regions of Yucatan and Honduras, but are known in the higher regions of Guatemala, the same line of reasoning leads to the belief that the birds do not alight as soon as they reach the south shore of the Gulf, but continue their flight to the mountains beyond. The case is not so clear on the south side of the Gulf as on the north, since so few competent ornithologists have visited this section, and since the birds' stay would be limited to the few days of passage in migration spring and fall.

Future observations may show that a few Canadian Warblers occur in northwestern Florida, and also along the coast of the Bay of Campeche, but as the record now stands it indicates that the principal route of migration of the Canadian Warblers of the northeastern United States is from the southern Allegheny Mountains across the Gulf of Mexico to the highlands beyond.

Along the route thus outlined it seems probable that the individuals from the northeastern United States of the following species pass in their migrations :

Olive-sided Flycatcher (*Nuttallornis borealis*).

Yellow-bellied Flycatcher (*Empidonax flaviventris*).

Philadelphia Vireo (*Vireo philadelphicus*).

Blue-winged Warbler (*Helminthophila pinus*).

Golden-winged Warbler (*Helminthophila chrysoptera*).

Bay-breasted Warbler (*Dendroica castanea*).

Canadian Warbler (*Wilsonia canadensis*).

If the southern part of the above route is carried eastward to include Honduras, it agrees with the present records of the eastern individuals of the Chestnut-sided Warbler (*Dendroica pensylvanica*).

If at the same time the northern part is supposed to start from the western slope of the Alleghenies, the route accords with the known facts concerning the migration of the eastern individuals of the Tennessee Warbler (*Helminthophila peregrina*).

If the southern end is shortened, making the flight from the

southern or southwestern Alleghenies to Yucatan, it becomes the route probably traversed by the eastern individuals of the Alder Flycatcher (*Empidonax trailli alnorum*), Least Flycatcher (*Empidonax minimus*), Blackburnian Warbler (*Dendroica blackburnie*), Wilson Warbler (*Wilsonia pusilla*).

Along the same general course, it seems probable that the eastern individuals of the Crested Flycatcher (*Myiarchus crinitus*) cross from Florida to Honduras; of the Baltimore Oriole (*Icterus galbula*) and the Prothonotary Warbler (*Protonotaria citrea*) from northern Florida to southern Yucatan or Honduras; of the Cerulean Warbler (*Dendroica cerulea*) from the western slope of the Alleghenies to an unknown destination in Central America; of the Kentucky Warbler (*Geothlypis formosa*) from the southern Alleghenies and northern Florida to an unknown district south of the Gulf of Campeche, and of the Mourning Warbler (*Geothlypis philadelphia*) from the coast of Louisiana and Texas to the highlands of Central America.

So few certain records are known in Central America of the Nighthawk (*Chordeiles virginianus*) and of the Cliff Swallow (*Petrochelidon lunifrons*) that only the broad statement can be made that the bulk of these two species cross the Gulf of Mexico, avoiding the West Indies, southern Florida, and Yucatan.

Almost all of the individuals of the Scarlet Tanager (*Piranga erythromelas*) seem to pass south in a narrow belt between central Cuba on the east and Yucatan on the west.

It will thus be seen that all of these twenty-two species cross the Gulf of Mexico, the difference arising from the carrying of the eastern edge of the route more or less to the west, and the variations in the length of the flight.

SUMMER RESIDENT BIRDS OF BREWSTER COUNTY,
TEXAS.¹

BY THOS. H. MONTGOMERY, JR.

THE present paper embodies the avifaunistic results of a collecting trip in Brewster County, from June 14 to July 5, 1904, when it was my good fortune to accompany the State Mineralogical Survey. To the director of the Survey, my friend Dr. William B. Phillips, I am greatly indebted for all the facilities placed at my disposal.

The region is one very little known to zoölogists, though Messrs. Oberholser and Bailey have collected in the Chisos Mountains which lie at the southern part of the county. The County of Brewster is situated in the southwestern part of Texas, between the 103rd and 104th degrees of longitude, and the 29th and 30th of latitude. Its southern border is the Rio Grande. A detailed topographical map of this region is in process of preparation by the Mineralogical Survey. The trip commenced from the town of Alpine, in the northwest, on the Southern Pacific Railroad; we reached Altudo, about 12 miles to the east, June 14 and remained there until the 19th; Altudo has an altitude of 4750 feet. From there we proceeded due east to the town of Marathon, with an altitude of a little more than 4000 feet, where we spent two days; thence south, spending one night at Garden Springs (3750 feet), one at Miller's Wells, then south to Marley's Wells (4000 feet) where we camped from the 24th to the 27th of June; then south again to Chisos Pen (3120 feet) where I remained to July 6, from there making a trip of two days to Green Gulch (4700 to 6000 feet) in the Chisos Mountains.

The country traversed may be said to be characterized by high and abrupt sierras, of volcanic rocks and limestones, bordering on high plains thrown into series of what now appear as rolling hills. Everywhere are the heavy marks of erosion. There is but little water, here and there at long distances a rain pool in the mountain sides, or a marshy spring in the plains; water is so scarce

¹ Contributions from the Zoölogical Laboratory of the University of Texas.

that on most of the ranches the cattle are supplied from wells; and where the water lies there is apt to be an oasis in the desert, — shade from a group of cottonwood trees, but elsewhere on the plateau one looks in vain for shelter from the sun. Cacti, greasewood bushes, dwarfed mesquite, and sotol bushes compose the characteristic flora of the plains, and in large districts the brown, baked earth bears no grasses. The flora of the mountains is richer and more varied, and the Chisos is well timbered with small pines, red oak and other trees.

The fauna is richest on the mountain sides and the wooded cañons, poorest on the plains. The latter may be said to be essentially Sauropsidan and Hymenopterous: birds, lizards, ants and wasps, with few Lepidoptera and Arachnida. One reason for the lack of richness in the fauna of these high plateaus is to be found, I think, in the occasional destructive torrents which sweep over them from heavy rains on the mountains; only the ants seem to survive these deluges. For most of the year there is total lack of water, with now and then destructive rivers of it.

Specimens of all the species mentioned in the following list were secured, unless otherwise stated. This list contains all the species seen except two or three species of hawks and one woodpecker, which could not be identified. A longer time spent in the Chisos Mountains and along the Rio Grande (which I did not reach) would undoubtedly add considerably to the number in the list.

There can well be no question as to all these species being summer residents, on account of the time of the year, and of the fact that most of the birds were in moulting plumage, and many were immature.

1. *Ægialitis vocifera*. KILLDEER PLOVER. — Alpine to Altudo, Marathon, Garden Spring; one or two pairs at each permanent spring.

2. *Callipepla squamata*. SCALED PARTRIDGE. — Common along most of the route, on the plains rather than on the mountain sides. This is known locally as the "blue quail."

3. *Cyrtonyx montezumæ mearnsi*. MEARNS QUAIL. — Two pairs at Green Gulch.

4. *Columba fasciata*. BAND-TAILED PIGEON. — Oak Spring cañon, Chisos Mountains; quite abundant around springs whither they come to drink.

5. *Zenaidura macroura*. MOURNING DOVE. — Several pairs observed at each of the camps.

6. *Cathartes aura*. TURKEY BUZZARD. — Present, but not in large numbers, along the whole route.

7. *Aquila chrysaetos*. GOLDEN EAGLE. — A pair of these birds were seen each evening at Altudo as they came to roost in the side of a cliff. According to the ranchmen they are still rather common in the county.

8. *Geococcyx californianus*. ROAD-RUNNER; "PAISANO BIRD." — Garden Springs, Marley's Wells, Chisos Pen; not numerous.

9. *Dryobates scalaris bairdi*. TEXAN WOODPECKER. — Marley's Wells, Chisos Pen, Green Gulch; fairly common.

10. *Phalaenoptilus nuttallii nitidus*. FROSTED POOR-WILL. — Altudo, Garden Spring, Marley's Wells, nesting on the mountain sides and strictly nocturnal.

11. *Chordeiles virginianus*. NIGHTHAWK. — A variety of the species was seen at Altudo, but not secured; it had the peculiar dropping descent and booming noise not shared by the following.

12. *Chordeiles acutipennis texensis*. TEXAN NIGHTHAWK. — Common at Christmas Spring and Chisos Pen, crepuscular rather than nocturnal.

13. *Aëronautes melanoleucus*. WHITE-THROATED SWIFT. — Seen and secured only at Green Gulch where there were about twelve pairs.

14. *Trochilus colubris*. RUBY-THROATED HUMMINGBIRD. — Common at Altudo and Green Gulch, above the plains.

15. *Tyrannus melancholicus couchi*. COUCH KINGBIRD. — One pair at Altudo.

16. *Myiarchus cinerascens*. ASH-THROATED FLYCATCHER. — Common at Altudo, Marley's Wells, Green Gulch, Chisos Pen.

17. *Sayornis saya*. SAY PHOEBE. — Two pairs at Altudo.

18. *Aphelocoma woodhousei*. WOODHOUSE JAY. — One secured, and others seen, about fifteen miles east of Alpine.

19. *Aphelocoma couchi*. COUCH JAY. — Common in Green Gulch, in the high timbered region of the mountains.

20. *Corvus cryptoleucus*. WHITE-NECKED RAVEN. — A species of raven, which was possibly this one, was seen but not secured at Alpine, Altudo and Chisos Pen.

21. *Corvus americanus*. AMERICAN CROW. — Seen at Marathon.

22. *Molothrus ater*. COWBIRD. — Either this species or its race, *M. a. obscurus*, was observed at most of the water holes visited, but none could be obtained.

23. *Sturnella magna*. MEADOW LARK. — A variety of this species was seen on the grassy plains at Altudo.

24. *Icterus parisorum*. SCOTT ORIOLE. — Common at Altudo, Marley's Wells and Green Gulch.

25. *Carpodacus mexicanus frontalis*. HOUSE FINCH. — One pair at Altudo.

26. *Passer domesticus*. ENGLISH SPARROW. — Common in the town of Alpine.

27. *Chondestes grammacus strigatus*. WESTERN LARK SPARROW.—A few found on the plains just west of Altudo.
28. *Amphispiza bilineata deserticola*. DESERT SPARROW.—I am in doubt as to whether my specimens are of this race or of *A. bilineata*, for they seem somewhat intermediate. Common among the mesquite at Garden Spring, Marley's Wells and Chisos Pen, not ascending the mountains.
29. *Peucæa cassini*. CASSIN SPARROW.—Common on the plains from Altudo to Marley's Wells.
30. *Aimophila ruficeps scottii*. SCOTT SPARROW.—At Altudo, much less abundant than the preceding.
31. *Aimophila ruficeps eremœca*. ROCK SPARROW.—Common in the timbered part of Green Gulch.
32. *Pipilo maculatus arcticus*. ARCTIC TOWHEE.—Common in the same locality as the preceding.
33. *Pipilo fuscus mesoleucus*. CAÑON TOWHEE.—Fairly common from Altudo to Green Gulch, nesting on the sides of the mountains.
34. *Pyrrhuloxia sinuata*. ARIZONA PYRRHULOXIA.—Marley's Wells and Chisos Pen, in mesquite thickets of the plains.
35. *Guiraca cærulea lazula*. WESTERN BLUE GROSBEAK.—Seen at Altudo, Garden Springs, and Green Gulch, but so shy that none were secured.
36. *Cyanospiza versicolor*. VARIED BUNTING.—One pair at Marley's Wells and at Chisos Pen.
37. *Petrochelidon lunifrons*. CLIFF SWALLOW.—A considerable number seen at Alpine, collecting mud for their nests.
38. *Lanius ludovicianus excubitorides*. WHITE-RUMPED SHRIKE.—One pair at Marley's Wells and at Chisos Pen.
39. *Mimus polyglottos leucopterus*. WESTERN MOCKINGBIRD.—Common along the whole route, on the plains and in the lower parts of the cañons.
40. *Toxostoma crissalis*. CRISSAL THRASHER.—Fairly common at Garden Spring and Marley's Wells.
41. *Heleodytes brunneicapillus*. CACTUS WREN.—Several found at Garden Spring.
42. *Catherpes mexicanus conspersus*. CAÑON WREN.—Altudo, Marley's Wells, and Green Gulch, high up on the mountains.
43. *Parus atricristatus*. BLACK-CRESTED TITMOUSE.—Common in the higher part of Green Gulch.
44. *Psaltriparus plumbeus*. LEAD-COLORED BUSH-TIT.—Common on the mountain sides at Altudo and Green Gulch.
45. *Psaltriparus lloydi*. LLOYD BUSH-TIT.—Timbered portion of Green Gulch.
46. *Auriparus flaviceps*. VERDIN.—Plains at Chisos Pen.
47. *Polioptila plumbea*. PLUMBEOUS GNATCATCHER.—Common at Garden Spring, Marley's Wells, and Green Gulch; found mostly on the high plains.

WHERE DOES THE LARGE-BILLED SPARROW
SPEND THE SUMMER?

BY JOSEPH GRINNELL.

STRANGE as it may seem, there is a land bird of California which abounds at times in suitable places but whose nesting grounds appear to be entirely unknown. This species, our only land bird yet remaining thus distinguished, is the Large-billed Sparrow (*Passerculus rostratus*). A bird of such unusual interest warrants particular attention. It is the object of my present article to show how little we really know about it, in the hope that some one may soon come forward with additional and definite information.

The bird was originally described¹ by Cassin in 1852 from specimens taken at San Diego. In 1859 Heermann recorded² it from San Pedro and Santa Barbara, as well as San Diego. Cooper in 1870³ added Cape St. Lucas to its list of record stations, and also presented some information in regard to its occurrence at San Pedro. This information, quoted far and wide to the present day, is to the effect that *Passerculus rostratus* was found breeding. But that there must have been some error seems now to be more than likely. The evidence for my belief in this respect is presented further on.

In 1883 Belding recorded⁴ the species as found in winter at several localities in the Cape region of Lower California; also in December and April at Guaymas, Sonora, across the Gulf from Lower California. In 1885 Brewster recorded⁵ two specimens taken by Stephens at Port [= Cape] Lobos, on the Mexican shore of the Gulf of California just south of the 30th parallel. These were taken on August 20, 1884, on a gravelly beach with no marshes near (as Mr. Stephens has recently informed me). In

¹ Proc. Ac. Nat. Sc. Phila., Oct. 1852, 184.

² Pac. R.R. Rep., X, 1859, 46.

³ Orn. Cal., I, 1870, 184.

⁴ Proc. U. S. Nat. Mus., V, March, 1883, 537; VI, 1883, 343.

⁵ Auk, II, April 1885, 198.

1890 Belding stated¹ that he had found the species common in winter only, in the Cape region of Lower California, and in the vicinity of San Diego Bay, but although he had searched for it in the latter locality during April and May he had been unable to find it later in the spring than March 10.

In 1893 Anthony recorded² Large-billed Sparrows as very common in fall and winter all along the seacoast of northern Lower California from San Ramon northward. He remarks on their abundance "until the nesting season approaches, when they suddenly disappear and are not again noticed until August." It is further stated by the same writer that a bird was seen by A. M. Ingersoll at San Diego apparently "carrying food for its young," but no nest could be found. Anthony also records that in April, 1887, he "shot a female at San Ramon that had undoubtedly left her eggs but a few moments before." But he subsequently says that in spite of patient search since, he has "never again seen birds during the nesting season," so that the above observations lack confirmation. In the same connection Anthony makes the following remark, with which I have reason to concur. "The eggs of this species which are frequently offered to the public by local collectors of Southern California have, so far as my observations have gone, always been taken from the nests of *A. beldingi* [= the Belding Marsh Sparrow]."

In 1898 I recorded³ the Large-billed Sparrow as "common in winter in the salt marshes and along the beaches" of Los Angeles County, but less numerous than the Belding Marsh Sparrow. "In San Pedro Harbor the birds frequent wharves and breakwaters, and even hop fearlessly about the decks of vessels, feeding on crumbs and flies. Although observed from August to late in April, this sparrow apparently disappears altogether during the summer months, but where it breeds seems to be as yet unknown." These statements both accord exactly with my knowledge at the present day and I have nothing to add.

In 1899 Price recorded⁴ what he called the St. Lucas Large-

¹ Land Bds. Pac. Dist., Sept. 1890, 145.

² Zoe, IV, Oct. 1893, 240.

³ Bds. Pac. Slope Los Angeles Co., March 1898, 36.

⁴ Bull. Cooper Orn. Club, Sept. 1899, 92.

billed Sparrow, with an interrogation mark, as "quite common" in November and December, 1898, on the marsh lands about the mouth of the Colorado River at the head of the Gulf of California. "It was not seen away from the coarse sea grass, *Uniola palmeri*."

In 1902 appeared Brewster's paper¹ reviewing the ornithology of southern Lower California. In this he states that "all the specimens [of the Large-billed Sparrow] thus far collected in the Cape Region have been taken in autumn, winter, or early spring. Indeed, there is no present evidence that the bird breeds anywhere in Lower California." Mr. Brewster's collector obtained no less than fifty-nine skins, secured from August 31 until "early March."

Joseph Mailliard has only this year recorded² a specimen taken at Santa Cruz, California, August 27, 1895. This is by far the northernmost station. And Breninger has even more recently recorded³ the species as secured in February on San Clemente Island.

This completes the definite distributional data at hand. Now let us turn to what evidence has been offered in regard to the breeding grounds of *Passerculus rostratus*. I have made personal inquiry of several observers who ought to know something along this line, if anything is known at all, but without eliciting any new facts. Mr. Frank Stephens, who is probably best posted of anyone on the general ornithology of the Southwest, writes me that he knows of "no breeding record that may be considered of value."

Cooper's statements,⁴ previously referred to, are as follows: "I found them plenty at San Pedro and San Diego at all seasons, and doubt whether they migrate at all." "At San Pedro I saw them in July feeding their young, but never found a nest that I was certain belonged to this species." Now here are some present day facts: The Belding Marsh Sparrow (*Passerculus beldingi*) is an abundant permanent resident on the salt marshes

¹ Bull. Mus. Comp. Zool., XLI, Sept. 1902, 138.

² Condor, VI, Jan. 1904, 16.

³ Auk, XXI, April 1904, 223.

⁴ Orn. Cal., I, 1870, 184.

in the vicinity of San Pedro (and San Diego, too). It nests profusely in the immediate vicinity of San Pedro, as can be attested to by numerous recent observers, such as Swarth, Morcom, Daggett, Law, Judson, and myself. But none of these students has detected the presence of the Large-billed Sparrow in the same locality, or anywhere else, for that matter, between "late in April" and August 31, as far as I have been informed. Now turning to Cooper's account of "*Passerculus anthinus*, the Titlark Sparrow," which to this extent equals the Belding Marsh Sparrow, we find these statements:¹ "They abound in winter south of San Francisco, but I am not sure that any of them spend the summer so far south, though inclined to think that they do. Near San Diego, in February, they began to utter a short but pleasant song as they perched on the top of some tall weed; and though I observed them there until April, I did not succeed in finding any nests, and *have not found the species at San Pedro in summer.*"² It is well known that Cooper collected but few specimens (often only one) of a species, and from the above-quoted statements it is plain to me that in his field observations he sadly confused the two species, which are not strikingly different out of hand. This reasonably accounts for the "breeding record" of *Passerculus rostratus* at San Pedro, which we need therefore no longer hesitate to put down as erroneous.

Right here it is interesting to note how definitely expressed assertions may have evolved from a very small foundation of fact. Among the many general accounts of the species in current literature, I select two of the extremest illustrations. In Reed's 'North American Birds' Eggs,' recently published, we read (p. 253) under the heading of Large-billed Sparrow, " . . . their nesting habits are similar to and the eggs not distinguished with certainty from those of the latter [Belding Marsh Sparrow]." Of course this is *probable*, perhaps; but have authentic eggs been compared? Again, in Wheelock's 'Birds of California,' we find under Large-billed Sparrow (p. 219), "California Breeding Range: along the salt marshes of the coast from the San Diegan district north to

¹ Orn. Cal., I, 1870, 183.

² Italics mine.

Santa Barbara" [1]. Also: "Its breeding habits are so similar to those of the Belding Marsh Sparrow that no separate description is necessary." What positive assurance! Such things would be only amusing if they were not a menace to the reputation of ornithology as a serious science.

In recounting the foregoing evidence I have not been endeavoring to prove that the Large-billed Sparrow does not breed at all! But simply that its whereabouts during the nesting season are not so far definitely known. This is for us to yet find out. To sum up, *Passerculus rostratus* is a migrant, occurring in winter on suitable seashores from Cape St. Lucas and Guaymas, Mexico, north as far as Santa Cruz, California. Its numbers are large enough so that its time of arrival and departure are easy to determine. But the interval between its departure in the spring and arrival in the autumn amounts to a period of four months, during which we know nothing of its whereabouts. It might not be a sin to speculate somewhat in this regard.

On the Atlantic coast a similar problem puzzled ornithologists for many years. The Ipswich Sparrow occurred on the coast of New England in winter, but totally disappeared in summer, no one knew where. The breeding grounds were finally discovered to be on Sable Island near Nova Scotia, to which it is now known to be exclusively confined during the nesting season. I once thought that *Passerculus rostratus* might have a similarly restricted habitat to the northward or westward somewhere. But all of the Santa Barbara group of islands have been explored in summer, and so has every other likely locality on the coast and islands of British Columbia and Alaska. That the Large-billed Sparrow has a northern insular breeding area, paralleling the case of the Ipswich Sparrow, seems to me therefore extremely doubtful.

The alternative theory is that the Large-billed Sparrow breeds somewhere to the *south* of its winter home, and *migrates north* in the fall, returning southwards each spring! Such a suggestion may seem absurd, but nevertheless fits best the limited amount of data so far in our possession. This possible southern summer home may exist on either coast of Lower California, or on the coast of Mexico, great stretches of which remain unexplored. The possibility that the closely related forms *sanctorum* and *gutta-*

tus (= *halophilus*), which appear to be chiefly represented so far in collections by *breeding* specimens, represent the worn summer plumage of *rostratus*, also presents itself. The effects of abrasion in fading colors, in restricting and intensifying shaft-streaks, and in modifying measurements, are well known. The many experienced workers who have studied the large series of specimens in eastern museums must have given these factors due consideration, so that we may be wasting space in suggesting this possibility. In either case, what a remarkable exception there would be to the rule of southward migration in the northern hemisphere!

Finally, let me ask the question again — Where does the Large-billed Sparrow spend the summer?

THE STATUS OF *HELMINTHOPHILA LEUCOBRONCHIALIS* AND *HELMINTHOPHILA LAWRENCEI*.¹

BY LOUIS B. BISHOP.

IN the way of theory as to the status of the puzzling specimens labelled with these names I have nothing new to offer, but wish simply to bring to your attention a few facts that seem to go far to establish an old theory, first advanced, I believe, by Mr. Chapman.

In southern Connecticut there are three distinct forms of the Blue-winged Warbler (*H. pinus*), taking males alone into consideration — the ordinary form with rich gamboge-yellow lower parts, white wing-bars and bright olive-green back; a second form, like the last but with gamboge-yellow wing-patch, resembling the Golden-winged (*H. chrysoptera*), which is much the rarest; and, third, a form with pale yellow lower parts, much paler back, and

¹ Read at the Twenty-second Congress of the American Ornithologists' Union, Cambridge, Mass., Nov. 29, 1904.

with usually yellow wing-bars; and between the three occur all sorts of intermediates. From this last pale form a series that I have collected near New Haven stretches without a break to typical specimens of Brewster's Warbler (*H. leucobronchialis*) with pure white lower parts and bluish gray back, the yellow last showing in the center of the breast. All three forms seem, to an extent at least, to breed true; although all the evidence tends to show that they mate together indiscriminately, and their song is indistinguishable. I took in the same piece of woodland August 9, 1904, an adult male and young each of the bright yellow form with yellow wing-bars. Two young taken with a female Brewster's Warbler near New Haven on July 4, 1893, prove on further comparison to have the yellow of the breast paler than in young Blue-winged Warblers of the same age; about half a dozen males showing in varying degree the character of Brewster's Warbler have been taken in one small piece of land within a few years; and on May 12, 1898, I collected two males within a few hundred yards of where I knew one was breeding the year before, and where I had taken one on May 8, 1896.

If *H. leucobronchialis* were a species and the intermediates hybrids between it and *H. pinus* it would certainly be true that in the majority of instances it would mate within the species, and such an occurrence seems never to have been observed, and as its white throat is not found in either *H. chrysoptera* or *H. pinus* it can hardly be a hybrid between them. That it is merely a phase of *H. pinus* is the only alternative left us.

Before discussing the plumage of the bird called Lawrence's Warbler (*H. lawrencei*), let us spend a few minutes in seeing what may be learned from the localities in Connecticut where it has been taken, and the distribution of the Blue-winged and Golden-winged Warblers in this State. *Helminthophila pinus* is an abundant summer resident of the coast, becoming rapidly rare farther north, but breeding at Bethel on the west, and Warren, and rarely at Portland, on the north: *H. chrysoptera*, however, is rare throughout the State, and is apparently absent along the coast east of New Haven. It occurs rather commonly at Portland, but breeds also at Bethel, and doubtless also at Bridgeport, Seymour, and New Haven, where it has been taken at the begin-

ning of the breeding season ; while both species are reported very rare, if they ever occur, at East Hartford — a few miles north of Portland. Specimens of *H. lawrencei* have been taken at Stamford, Bridgeport, New Haven, Seymour, and Portland — places where both species occur, but one or the other is extremely rare. Practically all the Golden-winged Warblers collected near New Haven have been found in a narrow strip of country radiating from the northwestern part of the city, and here also about all the Lawrence's have been taken. A male Golden-winged was taken there by myself May 12, 1894, and on May 15 and 20, 1896, two male Lawrence's were collected within half a mile of this bird by Mr. A. H. Verrill and myself ; and from this same stretch of territory Mr. Verrill brought me on May 23, 1898, a laying female of the Golden-winged and with her a male Blue-winged which he stated was nesting with this bird. The Blue-winged is abundant in this region, thus establishing an ideal condition for the production of hybrids.

The song of Lawrence's Warbler may resemble that of either of the above species, but has no characteristic of its own. These birds associate freely with both species, and have been found mated with the Blue-winged, but never with each other.

Typical specimens of *H. lawrencei* have, as is well known, no character of plumage peculiar to themselves, but only a combination of characters found in *H. chrysoptera* and *H. pinus* ; yet the majority of specimens recorded closely resemble the type, and to prove it a hybrid under these circumstances intermediates between it and the above species should be forthcoming. Such specimens it gives me pleasure to show you to-day. The type, you will remember, may be considered either a Golden-winged with the yellow chin, breast, abdomen, postocular and malar stripe and bright olive-green back of the Blue-winged, or the latter with the black auriculars and throat of the former ; the wing-bars being either yellow or white. In the majority of specimens I have seen the black of the throat extends over the chin, and this form is, I believe, the true hybrid between the two species, if it is a hybrid, as I trust these specimens will convince you. Birds like the type of *H. lawrencei*, with yellow chin, seem to be rarer, and are, I believe, the result of crossing the black-chinned birds

with *H. pinus*; at any rate such a male, that I took near New Haven May 10, 1904, has the wing-bars chiefly white, and was quarrelling with a Blue-winged Warbler in the manner that males of the same species do at this season. Two specimens similar to this were taken by Mr. Verrill a few years ago.

Between this form and *H. pinus* stands a bird taken in New Jersey, and described by Mr. Brewster in 'The Auk' for July, 1886. In this bird the solid black throat has become merely a black spotting about one-quarter of an inch wide, while the auriculars are still largely black. Bridging the last gap stands a male collected by Mr. Verrill and myself May 23, 1902, which differs from the ordinary Blue-winged only by having a little black on the auriculars and the black loreal stripe extending slightly below the eye, and a black spot on the outer vane of one or two feathers on the throat.

Midway between *H. chrysoptera* and *H. lawrencei* is a male collected by me at New Haven, May 11, 1900, which has the white postocular and malar stripe and white abdomen of the former, and the back chiefly bluish gray, but resembles in the rest of its plumage the yellow-chinned form of the latter. Nearer still to the Golden-winged is a female which Mr. Verrill brought me in the flesh May 21, 1902, with a male Blue-winged which he stated was its mate, which differs from typical specimens only in having much bright olive-green on the back, and yellow on the breast and abdomen. Lastly stands the fact that the majority of Golden-winged Warblers taken near New Haven have at least a trace of yellow on the back or breast.

From this evidence the conclusion seems to me to be irresistible that *Helminthophila leucobronchialis* is merely a leucochroic phase of *H. pinus*, which, from its appearing frequently only within a very limited area, may in time become a species; and that *H. lawrencei* is a hybrid between *H. chrysoptera* and *H. pinus*.

THE DECREASE OF CERTAIN BIRDS IN NEW
ENGLAND.

BY EDWARD HOWE FORBUSH.

IN THE course of an inquiry made in 1903 to determine the effects exerted on bird-life by an unusual season, some unsought evidence was received regarding a general and progressive decrease in the number of birds in certain sections. This suggested the propriety of further investigation to determine what species were known to be actually diminishing in numbers. This paper is intended as a sequel to the results of the first inquiry and a preliminary statement of some facts gleaned from the mass of material acquired in pursuing the second.

In summing up the evidence regarding the destruction of nests, eggs, young and adult birds by the severe weather of the summer of 1903 and the winter of 1903-04 the following statement was made regarding the bird probabilities for Massachusetts in 1904.

"If we assume that the evidence submitted approximates the facts, we may be justified in believing that the Bob-white has been reduced generally at least ninety-five per cent, that Grouse will be scarce this spring, and that Purple Martins will be generally absent, although a few individuals or colonies probably will appear locally in Massachusetts. There probably will be also an unusual local scarcity of many of the species mentioned [in the list of birds destroyed] and possibly of more not mentioned."¹

The inquiry made in 1904 seems to give to this statement the force of a prediction fulfilled. Of thirty-eight correspondents who speak particularly of the Bob-white, six now regard these birds as exterminated, thirty-one as nearly exterminated or rare, while only one finds them common. The diminution of the Bob-white is now a matter of common knowledge. However, many of these birds have been introduced from other States and liberated, during the season, by sportsmen's organizations, with the expectation that they will breed and restock the covers.

¹The Destruction of Birds by the Elements in 1903-04. By Edward Howe Forbush. Annual Report Mass. Board of Agriculture, 1903. p. 498.

The Ruffed Grouse also received a severe check; but the birds bred fairly well in 1904, and in many localities are now increasing. Purple Martins seem to have been rather rare in the spring migrations, except in northern New Hampshire, Vermont, and in Maine and Nova Scotia where they were fairly common.

A few birds came to Massachusetts about April 19, but, apparently, they all disappeared. An inkling of their fate was obtained in Concord, Massachusetts, where after a few cold days with five inches of snow which followed the 19th three out of the four adult birds observed were found dead in a bird house.

Forty-three observers in Massachusetts report as follows:—Martins gone or extinct, 26 reports; nearly extinct, 3; rare, 5; rare and decreasing, 8; as usual, 1. But the most significant fact regarding the disappearance of these birds is that thus far, with the exception of Springfield, where four colonies still persist, evidence has been secured of only three pairs breeding in 1904 in the entire State of Massachusetts, although it seems probable from what has been learned that many are breeding locally in parts of Vermont, New Hampshire, and Connecticut.¹ In Maine they suffered little except in the southwestern portion of the State and appear to be increasing in numbers rather than diminishing.

Chimney Swifts seem generally much reduced in numbers, and in some localities are rare; but in a few towns they seem as common as ever. In large sections of Massachusetts Barn Swallows and Tree Swallows are much reduced, evidently as a result of the storms of June, 1903; but in other sections no such reduction is noted.

Red-winged Blackbirds, Orioles, and Marsh Wrens appear to be scarce, locally, from the effect of the storms and floods of June, 1903; while Meadowlarks and Flickers are rare in sections of southeastern Massachusetts as a probable result of the severe winter following. These birds, however, appear to hold their own in other sections.

Reports from many parts of Massachusetts indicate that com-

¹ Since the above was written it has been learned by correspondence that a few birds bred in two other localities.

paratively few of those Warblers which breed in northern New England and northward were observed here in the migrations, and there was evidently an unusual local scarcity of such breeding birds as Chestnut-sided Warblers, Redstarts, and some Vireos. Still there seems to be no reason why most of these birds cannot speedily recover their usual numbers. The Purple Martin, however, has little foothold now in Massachusetts and a large part of southern New England. Everywhere empty Martin boxes are taken by the English Sparrows and the Martins, which have been decreasing for years, may never again be able to regain their former status here. The June storms of 1903 will long be marked and remembered by the passing of these beautiful, useful and familiar birds.

Turning now to the inquiry of 1904, our attention is at once arrested by the apparent marked and alarming decrease of game birds, and particularly that of certain wild fowl and shore birds.

Loons and Grebes seem to be decreasing rapidly on the inland waters of eastern Massachusetts. The Loon, which twenty or thirty years ago bred in the more remote northern ponds of the State, seems to have disappeared as a breeder. Along the coast both Loons and Grebes are still very common in migrations. The Surf Ducks, Eider Ducks and Shelldrakes apparently hold their own very well, but the pond and river ducks have fallen off tremendously within fifty or sixty years. The Ruddy Duck, formerly a common migrant, is now fast growing rare, and the Scaup Ducks seem to be slowly disappearing. Black Ducks appear now to be the most numerous ducks in the interior. Green-Winged Teal are very rare, and Blue-wings are not common and are seen only occasionally in small flocks. The Wood Duck seems generally verging towards extinction. Ten observers who speak particularly of this bird report as follows:—Extinct, 2; nearly extinct, 5; decreasing, 2; decreasing until last two years, 1.

The falling off among the shore birds seems to have been most remarkable. It is variously estimated as generally from fifty to seventy-five per cent within fifty or sixty years, while certain species are estimated to have decreased ninety-five per cent within ten or twenty years.

It is apparent that more protection is needed to save from

extinction the Bartramian Sandpiper or Upland Plover and some of its congeners, as well as the Golden Plover and the Curlews.¹

These birds once thronged our coasts, marshes or hillsides in immense flocks during migrations. Only a scattered remnant of this vast host now remains. The Long-billed Curlew appears to be nearly extinct in New England. Only thirty years ago the Upland Plover was a common breeding bird in the uplands of central Massachusetts. They bred then at Worcester within the city limits. Now they have nearly disappeared from the State as breeders, although a few are still found in some remote towns. They are also growing scarce in Vermont and New Hampshire.

Twenty-four observers report especially on Woodcock in their sections as follows:— Extinct, 1; nearing extinction, 8; rare or decreasing, 14; decreasing until the last two years, 1. Others believe that there has been a slight increase in the past two years owing to a law prohibiting market shooting of these birds.

Fourteen observers report Herons as diminishing in numbers, and only one reports an increase. Old gunners notice particularly the scarcity of Great Blue Herons, which they say were very common fifty to seventy years ago along the coasts and rivers. These herons have not been known to breed in Massachusetts for years.

The Passenger Pigeon, as is well known, has been practically extinct in New England for at least twenty years. They are occasionally reported as seen, but probably not one has been positively identified of late.

Mourning Doves appear to be generally rare and growing less. They are reported as follows: Extinct by 8 observers; nearing

¹ Certain Sandpipers and Curlews which are now rarely seen on the Massachusetts coast are still abundant in their seasons on the coast of South Carolina. The fact that flights of these birds are occasionally seen on the Massachusetts coast may indicate that they now ordinarily pass over the New England coast in their migrations to the south from their northern breeding grounds, and that they stop here only during stress of weather. The increasing occupation of the shores of Massachusetts and Connecticut in summer and fall by cottagers and gunners may even cause the birds to change their routes of migration. The Golden Plover is still common in the West. Whether the birds have been killed or driven away, New England is the loser.

extinction, 1; decreasing and rare, 11; holding their own, 1; increasing slightly, 3.

Birds of Prey seem to be generally decreasing along the Atlantic seaboard. Eagles are regarded as very rare and decreasing by 22 observers located near the cities or in the interior. Along the shore more are seen, but never in such numbers as in earlier years.

Twenty-two observers report Hawks and Owls in general as decreasing. Other reports follow:—Hawks and Owls increasing, 2; in usual numbers, 4; Hawks disappearing or scarce, 5; Hawks as usual, 2; Hawks as plenty as ever, 3; Hawks increasing, 4; Owls scarce, 4.

Screech Owls, many of which were killed by the last winter, are, in most cases, reported as uncommon, and in a few localities as rare or wanting this season. Saw-whet Owls, many of which were picked up dead last winter, are not reported this year by any observer.

The locations of the correspondents indicate that hawks in general are decreasing in the more thickly settled eastern parts of Massachusetts and holding their own or even increasing locally in the western part of the State. In northern New England they seem generally common. The Great Horned Owl seems to be growing rarer in all well-populated regions. The Red-tailed Hawk is apparently disappearing from many regions, and there is some evidence that the Red-shouldered Hawk is increasing and slowly taking the place of the other species.

The Pileated Woodpecker, which has been nearing extinction for many years, now appears to hold its own in northern Worcester County, Massachusetts.

Nighthawks seem to be decreasing over large areas. Reports follow:—Extinct, 2; almost extinct, 3; decreasing or rare, 18; plenty, 2; as usual, 1. How much the June weather of 1903 may have had to do with their scarcity we can only conjecture. But the Nighthawk has been gradually decreasing in much of eastern Massachusetts, and in some sections of the western part of the State, for many years. There is also evidence of a decrease in parts of northern New England.

Six observers report Whippoorwills as decreasing or gone.

The mass of material regarding the smaller birds that is contained in the nearly 200 reports on hand must be digested further before any positive statement can be made regarding these States.

There can be no doubt, however, that the House Wren is now either very local or absent in a large part of New England.

Twenty-nine representative Massachusetts reports on this bird may be summed up as follows:—Extinct, 11; nearing extinction, 2; rare, 10; decreasing, 4; holding their own, 1; plenty, 1. This sprightly little bird, which was evidently common within thirty or forty years over much of this region, seems on the whole to be slowly losing its slight foothold. In most cases where birds are said to be extinct, reference is had to breeding birds rather than to migrants, but House Wrens seem to have disappeared entirely in some cases.

Apparently, Barn, Cliff, and Bank Swallows, though increasing locally from time to time, have been diminishing generally in Massachusetts for at least forty years. Cliff and Bank Swallows are not found at all now in some sections where formerly they were abundant.

The decrease of Barn Swallows has been more gradual but nevertheless quite general over a considerable part of the State. This has been well known to ornithologists for years, and this inquiry furnishes additional and corroborative evidence.

Bobolinks are decreasing over considerable areas, but are apparently increasing in some localities in western Massachusetts. There are other instances of this kind.

The Wood Thrush is reported as decreasing rapidly in some sections and increasing in others.

There seems to be trustworthy evidence of a remarkable reduction of birds in general in some localities and an equally notable increase of the smaller species in others.

The Robin is reported to be increasing in nearly all sections. There is also considerable evidence to support the belief that the Scarlet Tanager and Rose-breasted Grosbeak have increased. The rise of the Bluebirds in recent years is well known.

To members of the American Ornithologists' Union most of the above will not be new, but it is written in the hope that it will again call attention to the imminent danger of extirpation which menaces certain species.

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It is not practicable here to discuss the causes of these fluctuations or to recommend measures for the protection of declining species. This must be left for the final report.¹ It ought to be possible for this association to make its influence felt toward securing such uniform legislation in different States as may be used to check the slaughter of waterfowl and shore birds, which otherwise must result in the extirpation of several species.

WILLIAM SWAINSON TO JOHN JAMES AUDUBON.

(*A hitherto unpublished letter.*)

BY RUTHVEN DEANE.

IN Dr. Elliott Coues's memorable address delivered at the Fifteenth Congress of the American Ornithologists' Union, entitled 'Auduboniana and other Matters of Present Interest,'² he called attention to the fact that the man whom Audubon finally selected to write the technical part of his 'Ornithological Biography' and 'Synopsis' was William MacGillivray. He also stated how fortunate it was that he had not fallen into the clutches of William Swainson as a collaborator in that great work, for in 1830 there were negotiations to that end. In 'The Auk' for 1898 Dr. Coues published a letter of Swainson to Audubon³ dated 2nd Oct. 1830, showing conclusively that further attempts to engage in a co-editorship were terminated.

I have before me another letter of Swainson to Audubon, and while it bears no date, there is a memorandum at the end, in Audo-

¹ The Decrease of Certain Birds and its Causes, with Suggestions for Bird Protection. Annual Report of Mass. State Board of Agriculture for 1904. In preparation.

² Bird Lore, Vol. III, 1901, p. 9.

³ William Swainson to John James Audubon (a hitherto unpublished letter). Auk, Vol. XV, 1898, pp. 11-13.

bon's handwriting, "Answered 29th Aug. 1830, J. J. A."; so it is fair to presume it was received shortly before that date. This letter was written while negotiations were still in progress, and a short time prior to the letter published by Dr. Coues, and shows that self-importance which characterizes some of his other unpublished letters.

I am under obligations to Miss M. Eliza Audubon, who has kindly allowed me to copy and publish this letter, for an exact transcript of the original.

"Thursday

"*My dear Mr. Audubon.*

"I received your letter yesterday, and hasten to reply to it. By some mistake or other, of Havell's, he has not sent the birds to which you allude, and I did not of course know that you had left them with him, now to your two propositions.

"First, as to boarding with us, you do not know, probably, that this is never done in England, except as a matter of necessity or profession, in which case the domestic establishment is framed accordingly. But this consideration would have no influence with me, in *your* case did other circumstances allow of it. It would however be attended with so many changes in our every-day domestic arrangements, that it becomes impossible.

"Secondly, as to the proposition I once made you, I am fearful you have put it out of my power to do *so much* as I *mighthave* done, from your having distributed the very birds which would have been the materials I was to work upon; and upon which only, any scientific observations truly original, (& therefore *worth* putting into your book), must be founded. Fortunately, however, my own collection is not poor in North American Specimens, and these would still furnish a mass of interesting information *to the Scientific*. It would be, however, highly advisable that all these species which I have not, but which you have brought home, and given away, should be borrowed back again, without delay.

"Next as to plan. I have always told you that the plan you mention, so far as your own narrative goes, is the *very best* which could possibly be chosen. *You* have to speak of the birds as they are alive, *I* to speak of their outward form, structure, and their

place in the great System of their Creator, for the true system, if I have, or anybody else, has discovered is not a *Human* System. If my views are correct, every observation you make, *plain, unvarnished*, and strictly *accurate*, will fully and perfectly harmonize. Our parts are totally distinct, and we have no occasion to consult with each other what we should say at every page. Where our views may differ, I shall not, of course, say anything. My own remarks had better be kept distinct, in the form of "Scientific Notes" to each letter, at the end, and in this way you will make the work, the *standard authority* on American Ornithology, which without Science, it certainly would not be, however interesting or valuable in other respects.

"As to time, and remuneration, I shall have completed all my portion of Dr. Richardson's¹ works in two months. I can then *devote* a portion of each day to yours. The terms of my remuneration will be those which I always receive from the Booksellers, and which are fixed, worth twelve guineas a sheet of the same size and Type as the Zoological Journal, each sheet being 16 pages, and each page averages 390 words, the calculation is there brought to a nicety, and you may spend as much as you choose. If I have to revise and correct the proofs, make alterations etc. that will be something additional, I always charge this by the *time* each sheet takes me, and would come to from 5/ to 7/6 a sheet but the booksellers generally give me a round sum, which I name after trying the three first sheets of a work, with Dr. Richardson's the case was different, I there had 300£ for my assistance and drawings. It would of course be understood that my name stands in the title page as responsible for such portion as concerns me.

"Should we arrange this matter, it will be time enough to fix on other minor points. But I should like to know your decision soon, as I have been applied to in another quarter. Indeed I am already so full of business, that I have two years active employment before me. I go for two days to assist Burchell² in the arrangement of

¹ As co-author of Swainson and Richardson's *Fauna Boreali-Americana*. Part II. The Birds. Born Nov. 5, 1787 — died June 5, 1865.

² William John Burchell, explorer and naturalist, who collected extensively in Brazil, Africa, and other countries. Born 1782? — died March 3, 1863.

his African Birds prior to publication, the end of the month, I shall bear in mind what you say on the Woodpecker but I have peculiar notions on *Species*, which, as I *believe* them correct, so I do not suffer to be influenced by the opinion of others, you will see more of this in my Book of American Birds. Our kindest remembrance to Mrs. Audubon, and always look upon me as your sincere, but very plain spoken friend.

W. SWAINSON.

"P.S. I had a long letter from Chas. Bonaparte¹ the other day, Vigors² is gone to Rome!!

"J. J. Audubon
c/o Mr. Thomas Fowler, Bookseller,
Manchester."

"Answered 29th Aug. 1830. J. J. A."

PLUMAGE WEAR IN ITS RELATION TO PALLID SUBSPECIES.³

BY JONATHAN DWIGHT, JR., M. D.

A MORE progressive generation of ornithologists will no doubt possess itself of higher standards for estimating the value of subspecies. At present the standards are shifting, dependent too much upon individual opinion and often entirely inadequate, even in the hands of trained observers. Under these circumstances it is not surprising that geographical races are viewed with disfavor by many who realize their shortcomings. The millennium has not arrived when the worn and faded breeding bird will be discarded as an unreliable basis for subspecies, and many of our races rest

¹ Charles Lucian Bonaparte. Born 1803—died 1857.

² Nicholas Aylward Vigors. Born 1787—died 1840. Naturalist. First Secretary of the Zoölogical Society of London.

³ Read at the Twenty-second Congress of the American Ornithologists' Union, Cambridge, Mass., November 29, 1904.

to-day upon no better foundation than a handful of worn specimens. The question to which I wish to direct special attention is whether in describing geographical races sufficient distinction has been made between the effect of climate on the feather and of climate on the species. In one case the feather alone yields to environment, in the other the species yields, and there is a wide difference between the two. The pallid races of arid regions, where dry atmosphere and sunny skies are most potent bleaching agents, will illustrate my meaning. If the feather at the time of its growth reflects climatic conditions by its paleness, we have here an inherent character that may very properly be made the basis of a subspecies, but if on the other hand the feather differs in no wise from one growing in a land of moisture and fades only as the months roll by, its fading is an accidental character that ought never to be recognized by a subspecific name. There are those who fail to grasp this distinction and believe in naming differences whenever found; but the real question at stake is not whether the paleness is of sufficient degree to merit a name, but whether the color is an intrinsic character. No one would think of calling a sunburnt man a subspecies, but the sunburnt plumage of the breeding bird is a fair mark for subspecific description!

The importance of the matter at once becomes obvious when we consider how many races depend for their recognition upon shades of color in breeding birds, and how little is known of the perfectly fresh plumage of these same birds. The effect of wear has been taken into account very little in naming them or perhaps largely guessed at, and what is most needed to-day is definite information regarding all the plumages of subspecies. This is no insignificant task, and though a thankless one it will be well worth the doing. My present intention is merely to call attention to it, for until moulting birds, which alone show the perfectly fresh plumage, are more abundant in collections than they are to-day, very little progress can be made in this direction.

A number of reputable subspecies might be selected to illustrate how little the matter of wear has been taken into account in naming them, but a few will suffice to show that I am not dealing wholly with generalities. As a familiar example of a pallid desert race, I have chosen the Desert Sparrow Hawk (*Falco sparverius*

phalæna), for in examining a series of over 200 Sparrow Hawks I have found an unusual number in the midst of moult, making accurate comparisons of old and new plumages possible. On comparing newly-moulted specimens from eastern North America, from the Mississippi Valley, from the Rocky Mountains, from British Columbia, from California, and from Arizona, I find that the fresh plumage of birds from all of these widely differing regions is identical. This is true not only of adults but of young birds in all plumages. Under these circumstances it is only possible to conclude that Sparrow Hawks after a moult fade into pale *phalæna* in a dry climate, remaining darker wherever the atmosphere is more humid. Furthermore, it is significant that during the breeding season when *phalæna* is perhaps most typical, the humidity of the air at Denver, we will say, is below 50% while in Boston or New York the average is above 70%. Similar conditions prevail at the time of the prenuptial moult, for the fresh plumage of the Arizona bird is as dark as that of the Eastern, and only fades on exposure to the hot dry air of the Southwest. As *phalæna* therefore possesses no intrinsic character, it should not possess a name. The plumage is sunburnt, but there is none of the incipient variation of which races are thought to be the exponent. It is perhaps fortunate that the describer of *phalæna* did not name the other "regional phases" that he was able to distinguish. What is true of the Sparrow Hawk is undoubtedly true of other species, but it is far easier to describe a race than it is to produce evidence that invalidates it, and easier still to confuse wear with subspecific characters.

Most writers have concerned themselves with the effect of climate on the species, not its effect upon the individual. Mr. Grinnell, however, has discussed the effect of wear upon several California species (Auk, 1902, pp. 128-131). He states that a race of the Russet-backed Thrush known as *adica* does not in early summer differ from typical *ustulata* taken in Sitka, Alaska, but later in the season fades in the drier, brighter atmosphere of California. This is unquestionably true, and I have satisfied myself of the fact by the examination of numerous specimens. It is desirable, however, to compare fresh plumages; still, in the case of this Thrush, unless the new plumage is alike in both forms

at the period of the last moult, California breeding birds could hardly be matched by those from Alaska.

My conclusions in regard to the American Goldfinch (*Astragalinus tristis*) are along this same line (Auk, 1902, pp. 149-164). I stated that I could find practically no difference in color between the fresh plumage of the California race *salicamans* and that of the eastern bird. In this case, however, the eastern Goldfinch seems to be the pallid race, and this is naturally to be expected, for where *salicamans* is found on the Pacific Coast the humidity averages about 10% greater than in the East.

Some plumages and some colors yield more rapidly to wear while others are practically insusceptible, especially those plumages having metallic colors like the Hummingbirds or Swallows. It is perhaps significant that there are few races of these and similar species. The Cliff Swallow (*Petrochelidon lunifrons*) that builds his nest in the shadow of the desert mesas differs not a whit from his brother that skims the green fields of New England, nor does the plumage of the Dove (*Zenaidura macrura*), so widely distributed over both humid and arid portions of the United States, yield to atmospheric variations. There is, however, an odd exception in the case of the Purple Martin (*Progne subis*), of which a pale race *hesperia*, has been described based entirely on characters of the adult female. As a matter of fact she yields to climatic influences only at the points (the collar, the forehead, etc.) where she lacks metallic feathers. The male, on the other hand, being wholly steel-blue and resistant at every point, shows no variation from season to season. There does, however, seem to be one slight character in the somewhat whiter tail-coverts of the western female, but it does not hold in young females nor in young males, both eastern and western birds having the tail-coverts equally white. We have, therefore, at best, a race which rests upon one weak character, peculiar to one sex, and to the adults only of that sex.

The immediate and obvious effects of humidity as a preservative of plumage have not been carefully estimated in individual races and if a bird must be caught on its breeding ground to tell what subspecies it belongs to, it looks as if there might be something wrong with the subspecies. Take the case of Alma's

Thrush (*Hylocichla ustulata almae*) which it is claimed differs from *swainsoni* by its grayer coloration, a character that would seem more likely to have been inherited from northern ancestors than imposed by present climatic conditions. I have compared a good many breeding birds from Alaska with others from Eastern Canada and the difference between them is very slight and not easily made out. The Alaska birds average slightly grayer but I have seen several Canadian specimens that are typical *almae*. What the variation in the fresh plumage of *almae* may be I do not know, but *swainsoni* shows so great individual variation, that I think it would be mere guesswork to call pale winter birds taken in Texas, we will say, *almae* and dark ones *swainsoni*. Here again I believe the validity of the subspecies turns on the comparison of fresh plumages which are not at present available, and the same thing may be said of the Juncos and the Horned Larks and a dozen other species of birds whose limits of variation in fresh plumage are quite unknown. Among the thousands of birds in collections a very small percentage throw light upon this matter, and until new plumages are thoroughly studied there is ample justification for regarding many of the pallid races with suspicion. To place them on a thoroughly scientific basis, eliminate the direct effects of wear and the characters which remain will represent to a greater or lesser degree geographical variation. Unless I am much mistaken subspecies will eventually be recognized by better characters than those visible in breeding birds alone, and will represent more thorough work than the mere matching of shades of color or averaging of dimensions. The discovery of new races will mean more work and less play.

NOTES ON THE BIRDS OF THE AU SABLE
VALLEY, MICHIGAN.

BY NORMAN A. WOOD AND EARL H. FROTHINGHAM.

THE recent discovery of the breeding of Kirtland's Warbler in the valley of the Au Sable River, Mich., has given that region a peculiar interest from an ornithological standpoint. The fact that this bird has remained so long unknown indicates that the bird life of the vicinity has been very little studied, and observations upon it should be of value.

These observations were made during two trips undertaken by Mr. T. G. Gale and the writer as follows: On June 13, 1903, we drove from West Branch, Ogemaw Co., Mich., to the Au Sable River, and stopped at the home of James Parmalee, three miles north of the village of Luzerne in Oscoda County. Exclusive of the river valleys, the country traversed is typical of this region. It consists of wide sand and gravel plains varied by morainal ridges and marshy depressions, and extensively dotted with burnt stumps and logs, which identify it as "old pine lands." Large areas are almost without ground cover; in others jack and Norway pines occur in scattered clusters interspersed with scrub scarlet oak and aspen, while the ground is hidden by thick growths of sweet fern, blackberry, and huckleberry bushes. The barrenness of the soil is attested by numbers of deserted farms.

At the river valley we found four general types of vegetation, each apparently dependent upon drainage and the elevation of the site above the river. The lowest of these occur on limited areas of bottom land, and is largely composed of elms and ashes, with a thick undergrowth of berry bushes and seedling hardwoods. Among the birds noticed in this vegetation were, Chestnut-sided and Black and White Warblers, Cedar Waxwings, Wood Pewees, Great Crested Flycatchers, Rose-breasted Grosbeaks, and Song Sparrows.

About ten or fifteen feet above the level of the river is a relatively dry terrace on which scrub oak and sweet fern grow in abundance.

This terrace continues for a distance of one hundred to two hundred yards from the river, and here we saw Robins, Kingbirds, Flickers, Cowbirds, Goldfinches, Vesper Sparrows, Chipping Sparrows, and Brown Thrashers.

From this terrace a steep, swampy slope covered with spruce, balsam, white cedar, and tamarack rises eighty to one hundred feet to a morainal topography, the greater part of which presents a dry, sandy surface supporting thickets of jack pine undergrown with sweet fern. Characteristic birds of the slope are the Black-throated Green Warbler, White-throated Sparrow, Whip poor-will, Hermit Thrush, Ovenbird, Song Sparrow, Hairy Woodpecker, and Ruffed Grouse; while among those of the higher, dry land are the Field Sparrow, Vesper Sparrow, Junco, Shore Lark, and Kirtland's Warbler. Several birds, including the Sparrow Hawks, the larger Buzzards, Blue Jays, and Chickadees were found to be of general distribution.

On the second day following our arrival, while walking among jack pines on a ridge about three hundred yards from the river, we heard a strange bird song which we traced to a warbler with which we were not familiar. We saw near by two other warblers of the same kind, both of which were singing. At eleven o'clock of the same day we drove from Parmalee's northwest to the north branch of the river, a distance of seven miles. During the first hour of the drive we heard the song at six or eight places along the road, and at last saw one of the warblers on a high, burned stump in a slashing. Mr. Gale shot the bird, which proved to be a breeding male. From this time on we saw no more of the warblers, which seemed to be confined to jack pine thickets. After our return, — June 21, — to Ann Arbor, the specimen was identified as Kirtland's Warbler¹ and placed in the University Museum.

The discovery of this breeding colony of Kirtland's Warbler, added to the fact that among the birds of the locality several northern forms had been observed, notably the Arctic Three-toed Woodpecker, the Junco, the White-throated Sparrow, and the Pine Siskin, made it desirable to study further the bird life of the river valley. Accordingly another trip was taken.

¹ Bull. Mich. Ornith. Club, Vol. IV, p. 61.

Mr. Gale and the writer started on a second trip from the town of Roscommon, August 8, and floated the length of the Au Sable River, — about three hundred miles, making the trip in fifteen days. Kirtland's Warbler was not seen on this trip, although the localities where it had previously been were carefully searched.¹

The Au Sable River rises in the southwest corner of Otsego County. It flows almost due south to Grayling, whence it bends to the east. It receives two large tributaries in Crawford County, *viz.*: the South Branch, rising in Roscommon County, some twenty miles east of Roscommon, and the North Branch, whose head is in Otsego Lake, Otsego County. Big Creek enters from the south in Oscoda County, and the Lower South Branch in Iosco County, and this completes the number of larger tributaries. The stream drains a topography of glacial origin, and as a consequence frequently cuts through morainal ridges, which give the river its steep bare bluffs of sand or clay. These bluffs are usually crowned with a thin turf bearing stunted jack pines and thick mats of sweet fern. The bluffs alternate with areas of low land, known respectively as cedar and hardwood swamps. The former consist of thick stands of white cedar, balsam, spruce, tamarack, and birches, in varying proportions. In the hardwood swamps white elms predominate, associated with basswood, white and black ash, and red maple. The banks are lined for long stretches with bushy alders. At other places the bank vegetation is of saw-grass, wild rice, milkweeds, golden-rod, cardinal flower, and sour dock, with arrowhead, spatterdock, eel grass, and pickerel weed growing in

¹ During the summer of 1904 I made the following observations with regard to the occurrence of Kirtland's Warbler in Crawford County. On July 21, a male was heard and seen on the top of a high, sandy ridge, a mile north of Higgins Lake. This ridge was covered with an open sprout growth of red, white and scarlet oaks, red maple, black cheery, june-berry, and prairie willow, not over eight feet high. A heavy undergrowth of brake, sweet fern, and huckleberry bushes completely concealed the ground. A pair of these birds was observed at the same locality on successive days for at least a week, but though they were seen with insects in their bills and gave every indication of nesting, I was unable to find the nest. A second pair was observed July 22, about a half mile from the above location, but these birds apparently were not nesting.

the water. Lenticular islands are of frequent occurrence wherever logs or stumps have lodged in the channel.

A noticeable change is to be observed in the tree life of the river as one passes from Crawford and Oscoda counties into the lower waters of Alcona and Iosco counties. Here a gradual increase may be noted in the areas covered by willows and poplars, while swamp oaks, hard and soft maple, and hemlocks tend to replace the soft woods of the cedar swamps. This change in the character of the vegetation is probably due to the varying proportions of high and low lands, the latter, as is usual in the lower and older parts of a river valley, increasing in amount toward the mouth of the river.

The accompanying list of 103 species of birds, in which Mr. Wood's and my notes have been incorporated, was taken from the notes made during each excursion, and thus represents more or less completely the bird life of the valley, for the period from June 13 to September 22. — E. H. F.

The observations and data which I have contributed to the following list were made during two trips on the river in the summer of 1903. The first trip was made in search of the Kirtland Warbler for the University Museum,¹ and extended down the South Branch from Roscommon to the Au Sable, and as far as Big Creek in Oscoda County. This is about seventy miles, by river, from Roscommon. My notes on this trip cover a period of sixteen days, from June 30 to July 16, and therefore at a time when most of the birds were breeding, or feeding young. This gives us a list of the summer residents.

My second trip was made in company with Professor J. E. Reighard. On the morning of Sept. 6, we started down the Au Sable River from Grayling in a boat to make a survey of the life in and along the river. This trip occupied fifteen days and covered a distance of about one hundred miles in a straight line, or about three hundred by the river.

Grayling is a small town of about 1500 inhabitants, and is situated in the western part of Crawford County, Michigan, on the

¹ Bull. Mich. Ornith. Club, Vol. V, pp. 1-13.

eastern side of a high ridge which is the watershed of this part of Michigan, and is the highest land on the lower peninsula. It is 1300 to 1450 feet above the sea. From this watershed in Otsego County starts the Au Sable River, the main stream running south to Grayling about twenty-five miles, then east and southeast to Oscoda on Lake Huron. The North Branch, a good sized stream, also starts in Otsego County and running southeast joins the main stream about thirty miles east of Grayling. This town is built on a high, level, barren terrace of light colored sand and is a poor place for birds. I saw here the English Sparrow, the Song, Vesper, and Chipping Sparrows, a flock of Red-winged Blackbirds, a few Robins and a Marsh Hawk near the river.

The Au Sable River here is small, only two to three rods wide and deep enough to float a small boat; the banks are lined with cedars, most of them dead. I had fine views of the birds which were feeding in the trees along the river. In the dead trees I saw the Hairy, Downy, and Red-headed Woodpeckers (this last species not very common here), Yellow-bellied Sapsucker, both the White and Red-breasted Nuthatches, and the Flickers. These latter and the Blue Jays were never out of sight or sound. In the live cedars and tamaracks I saw the Goldfinches, Kinglets and Myrtle Warblers. We had gone but a few miles when I saw a Lincoln's Sparrow perched in a low bush at the edge of a thick swamp. We had the opportunity (my first) of seeing this rare sparrow at close range, about fifty feet. Its peculiar color and markings make this bird easy to identify. While I was waiting for a better shot the bird disappeared in the thick brush and was not seen again. Near here I saw a Tennessee Warbler, close to the edge of the water, and heard the sharp rattle of a Kingfisher. Flocks of Chickadees were feeding in the cedars, while on the higher banks I saw the Junco.

At the junction of the North Branch with the Au Sable we camped for two days. This was not far from the locality where, in July, I found the Kirtland Warblers breeding, and on Sept. 12 we made a visit to the locality. I did not expect to find any of the birds so late in the season. The spot looked the same as when I last saw it, even to the tree where I first saw the male of the first nest. This bird used this tree as a post of observation

and for song. The day that I found the nest he flew down scolding and alighted near the top of a small jack pine immediately under this tree. Between this tree and the road was the place where I found the first nest.¹

In the immediate vicinity of the nest we saw the Bluebird, Robin, Chipping, Song, and Vesper Sparrows, Slate-colored Junco, White-breasted and Red-breasted Nuthatches, Flicker, Kingbird, Sparrow Hawk, Hairy, Downy, and Red-headed Woodpeckers. I found these birds breeding here in July.

In the cedar swamps and at the edge of the plains bred the Hermit, Wood, and Wilson's Thrushes, also the Ruffed Grouse, Maryland Yellow-throat, Towhee, Brown Thrasher, White-throated Sparrow, Rose-breasted Grosbeak, Indigo Bird, Cedar Bird, Red-eyed Vireo, Black and White Warbler, Nashville and Yellow Warblers, Brown Creeper, Black-throated Blue and Chestnut-sided Warblers, Oven-bird, Black-throated Green Warbler, Catbird, Redstart, Winter Wren, Bob-white (rare), Mourning Dove, Barred Owl, Great Horned Owl, Yellow-billed and Black-billed Cuckoos, Arctic Three-toed Woodpecker (I shot a young bird July 10, 1903), Yellow-bellied Sapsucker, Pileated Woodpecker, Whip-poor-will, Nighthawk, Ruby-throated Hummingbird, Crested Flycatcher, Olive-sided Flycatcher, Least Flycatcher, Wood Pewee, Blue Jay, White-rumped Shrike, Crow, Cowbird, Bronzed Grackle, and American Goldfinch. Along the river bred the Hooded Merganser, Kingfisher, Bank Swallow, Spotted Sandpiper, Great Blue Heron, Bald Eagle, American Woodcock, Phœbe (under the bridges), and Marsh Hawk. I was told that the Spruce or Canada Grouse nested on the plains, but I did not

¹ I think they migrate slowly in the fall, reaching southern Michigan about the fifteenth or twentieth of August. Lynds Jones, in the 'Birds of Ohio,' p. 185, reports seeing two near Ironton, Lawrence Co., Ohio, Aug. 28, 1902. I expect these birds the first two weeks in August at Ann Arbor. Mr. J. A. Parmalee writes me that the last Kirtland seen in this colony in 1903 was Aug. 20, and the last one seen in 1904 was on Sept. 3. His earliest spring record is May 3, 1904, and the earliest nesting record June 6, 1904, a set of three. Mr. Parmalee says: "The male does not help build the nest, but sits near by and sings constantly." He also states that this colony is much larger than in 1903.

see this species. I found hunters who reported that they had taken them in fall or winter.

As we went down the river the descent was very gradual for the first two hundred miles, about 200 feet for every 100 miles, until we reached the rapids in Alcona County where the fall was 269 feet per hundred miles, and perhaps one half of this fall occurs in a distance of five miles.¹

Passing from Alcona into Iosco County, the descent was quite noticeable and the river much swifter. In the lower fifty miles the river was slower and full of islands; the channel also was wide and marshy, with submerged swamps full of dead trees. Here we saw the willow along the river's margin. Below the rapids we saw for the first time extensive meadows, and in them were the Meadowlark and Red-winged Blackbirds.

In the region of highest altitude, or from Grayling, Oscoda County, 1250 feet, down to Flat Rock, Alcona County, about 900 feet, we find some northern forms such as White-throated Sparrow, Junco, Red-breasted Nuthatch, Winter Wren, Hermit Thrush, Olive-sided Flycatcher, Arctic Three-toed Woodpecker, and Kirtland's Warbler, all Canadian fauna. Below 900 feet (to the lake, 581 feet) we found such forms as the Meadowlark, Purple Martin, Yellow-throated Flycatchers, Mourning Dove, and the Red-winged Blackbird. — N. A. W.

ANNOTATED LIST.

1. *Colymbus auritus*. HORNE GREBE.—Alcona Co., Sept. 19, one seen in a bayou.

2. *Podilymbus podiceps*. PIED-BILLED GREBE.—Crawford Co., Sept. 12, very few seen. Oscoda Co., Sept. 15, occasionally seen. Alcona Co., Sept. 20, one seen. Iosco Co., Sept. 21, quite rare.

3. *Merganser americanus*. AMERICAN MERGANSER. —Crawford Co., Sept. 5, two seen. Oscoda Co., Sept. 18, a pair seen at mouth of North Branch. Alcona Co., Sept. 19, a female seen on the river. These were perhaps migrants.

4. *Lophodytes cucullatus*. HOODED MERGANSER.—Crawford Co., June 30. Several females with young were seen on South Branch.

¹ These estimates of altitude were made from data kindly furnished by Mr. Frank Leverett.

On July 1, several broods unable to fly were seen. Oscoda Co. July 1, one young shot; Sept. 13, 16, common. Alcona Co., Sept. 19-20, common. Iosco Co., Sept. 21-22. Common, breeds.

5. *Anas boschas*. MALLARD.—Iosco Co., Sept. 21. Two seen, probably migrants.

6. *Aythya affinis*. LESSER SCAUP DUCK.—Alcona Co., Sept. 19. One seen, no doubt a migrant.

7. *Ardea herodias*. GREAT BLUE HERON.—Crawford Co., Aug. 13, June 30, Sept. 6, occasional. Young and old observed. Oscoda Co., Aug. 19, frequent; July 1, common. Alcona Co., Sept. 19, one seen. Iosco Co., Aug. 22, frequent; Sept. 20-21, a few seen.

8. *Philohela minor*. AMERICAN WOODCOCK.—Crawford Co., Aug. 12, saw three in a swamp of conifers and hardwoods with thick underbrush. Oscoda Co., July 1, near Butler Bridge in elm woods; Sept. 15, mouth of Big Creek, four seen. Reported as breeding by James Buchanan, a resident.

9. *Helodromas solitarius*. SOLITARY SANDPIPER.—Crawford Co., Aug. 8, frequent. Oscoda Co., Aug. 19, frequent. Iosco Co., Aug. 6.

10. *Actitis macularia*. SPOTTED SANDPIPER.—Crawford Co., Aug. 13, June 30, Sept. 6, 12, common. Oscoda Co., June 14, frequent; nest seen (Frothingham); July 2-16, Aug. 7, 16, 19, Sept. 13-15, common. Alcona Co., Sept. 19, common. Iosco Co., Sept. 20, 21, common. Almost constantly in sight of the bird all along the river (Wood).

11. *Colinus virginianus*. BOB-WHITE.—Crawford Co., June 16, occasional; June 30, one heard near Roscommon; Aug. 9, occasional; Sept. 5. A few flocks are said to have worked in near Grayling from the south and west during the last ten years. Alcona Co., Aug. 20, occasional.

12. *Bonasa umbellus*. RUFFED GROUSE.—Crawford Co., Sept. 13, two seen. Oscoda Co., June 13, female and young seen; Aug. 7, 15, frequent; July 4, one seen at Butler Bridge, adult male. Alcona Co., Aug. 20, frequent; Sept. 20, one male shot. Iosco Co., Aug. 22, occasional; Sept. 21, one male shot.

13. *Zenaidura macroura*. MOURNING DOVE.—Crawford Co., Aug. 9, 13, occasional; June 30, Sept. 6, a few pairs seen. Oscoda Co., Aug. 15, July 2, 15, occasional. Alcona Co., Sept. 20, not common. Iosco Co., Sept. 21, one pair observed.

14. *Circus hudsonius*. MARSH HAWK.—Crawford Co., Sept. 5, Grayling, immature male seen. Oscoda Co., July 7, not common. Alcona Co., Aug. 20, one seen.

15. *Accipiter velox*. SHARP-SHINNED HAWK.—Oscoda Co., Aug. 19, a female shot.

16. *Accipiter cooperii*. COOPER'S HAWK.—Crawford Co., Sept. 8, one seen. Oscoda Co., Aug. 15, occasional. Iosco Co., Aug. 22, one seen.

17. *Buteo borealis*. RED-TAILED HAWK.—Crawford Co., Sept. 10, occasionally seen. Oscoda Co., Sept. 15, a pair seen at McKinley. Alcona Co., Aug. 20, two seen; Sept. 20. Iosco Co., Sept. 20, 21, occasional.

18. *Haliaeetus leucocephalus*. BALD EAGLE.—Crawford Co., June 30, two seen, one young bird; Sept. 7, 9, occasional. Heard of one pair breeding on the South Branch.

19. *Falco sparverius*. AMERICAN SPARROW HAWK.—Crawford Co., Aug. 9, occasional; Aug. 13, frequent; June 30, July 10, Sept. 6, common. Breeding in the dead trees on the plains; young seen. Oscoda Co., June 15, Aug. 17, frequent; July 2, 16, Sept. 13, 15, common. Alcona Co., Sept. 19, 20, most common hawk seen. Iosco Co., Sept. 21, commonly seen.

20. *Pandion haliaeetus carolinensis*. OSPREY.—Crawford Co., Sept. 9, shot an immature bird at Camp Stevens, eight miles east of Grayling. Probably breeds; a number seen. Oscoda Co., Sept. 15, occasionally seen. Alcona Co., Aug. 20, one seen; Sept. 20. Iosco Co., Sept. 21.

21. *Syrnium varium*. BARRED OWL.—Oscoda Co., Aug. 18, one seen. Alcona Co., Aug. 20, one heard.

22. *Bubo virginianus*. GREAT HORNED OWL.—Crawford Co., June 30, three seen on South Branch, two were young; Aug. 9, common, young shot; Aug. 10, 11, common; Sept. 3, two seen. Oscoda Co., Aug. 13, 17, saw one each day; Aug. 18, 19, common; July 2, Sept. 12, saw a number. Alcona Co., Sept. 19, common. Iosco Co., Sept. 20, 21, common.

23. *Coccyzus americanus*. YELLOW-BILLED CUCKOO.—Oscoda Co., July 4, 12, occasional; probably breeds.

24. *Coccyzus erythrophthalmus*. BLACK-BILLED CUCKOO.—Oscoda Co., July 7, 12, occasional. Iosco Co., Sept. 20, one seen.

25. *Ceryle alcyon*. BELTED KINGFISHER. Crawford Co., Aug. 8–13, common; June 30, July 10, common, breeding in the high banks, young seen; Sept. 6, 12, common. Oscoda Co., June 14, frequent; July 2, 16, Aug. 16, 19, Sept. 10, 14, common. Alcona Co., Sept. 19. Iosco Co., Aug. 22, common; Sept. 20, 21.

26. *Dryobates villosus*. HAIRY WOODPECKER.—Crawford Co., Aug. 9, 13, June 30, July 10, Sept. 6, common. Oscoda Co., June 16, frequent; Aug. 15, common, Aug. 19, frequent; July 2, 16, common, young seen; Sept. 11, common. Iosco Co., Sept. 20, 21.

27. *Dryobates pubescens medianus*. DOWNY WOODPECKER.—Crawford Co., Aug. 13, frequent; June 30, July 10, Sept. 6, 10, common. Oscoda Co., Aug. 17, frequent; July 2, 16, Sept. 13, 15, common. Iosco Co., Aug. 22, frequent, Sept. 20, 21.

28. *Picoides arcticus*. ARCTIC THREE-TOED WOODPECKER.—Crawford Co., July 10, one young female shot two miles west of North Branch; Sept. 12, one shot, adult male, two miles north of the mouth of North Branch. Oscoda Co., June 18, one seen.

29. *Sphyrapicus varius*. YELLOW-BELLIED SAPSUCKER.—Crawford Co., June 15, not common; Aug. 9, 13, frequent; June 30, July 2, common, young shot; Sept. 6, common. Oscoda Co., Aug. 15, occasional; July 2, 16, common; Sept. 15, one immature male shot at mouth of Big Creek. Breeds. Alcona Co., Sept. 19, occasional. Iosco Co., Aug. 22, occasional; Sept. 21, occasional.

30. *Ceophlœus pileatus abieticola*. NORTHERN PILEATED WOODPECKER. — Oscoda Co., July 5. Reported as breeding at Butler Bridge. Alcona Co., Sept. 19, one seen near river bank.

31. *Melanerpes erythrocephalus*. RED-HEADED WOODPECKER. — Crawford Co., Aug. 12, 13, not common; June 30, occasional. Oscoda Co., Aug. 15, frequent; July 2, 15, common in Kirtland Warbler colony, young seen; Sept. 18. McKinley, one immature male shot. Alcona Co., Aug. 20, frequent; Sept. 19. Iosco Co., Aug. 22, frequent; Sept. 20.

32. *Colaptes auratus*. FLICKER. — Crawford Co., Aug. 8, common; Aug. 9, frequent; Aug. 13, common; June 30, July 10, common, breeding on South Branch; Sept. 6, common. Oscoda Co., June 14, Aug. 15, 19, July 2, 16, Sept. 13, common. Alcona Co., Sept. 19, common. Iosco Co., Aug. 6, Aug. 22, frequent; Sept. 20, 21, common. Most common Woodpecker of this section of the State (Wood).

33. *Antrostomus vociferus*. WHIP-POOR-WILL. — Crawford Co., Aug. 8, 12, common; Aug. 13, July 6, frequent; Sept. 9, one shot at Steven's Camp. Oscoda Co., June 14, Aug. 7, 15, frequent; July 5, 15, common; Sept. 13, one heard calling in the evening. Alcona Co., Aug. 19, frequent. Iosco Co., Aug. 22, frequent.

34. *Chordeiles virginianus*. NIGHTHAWK. — Crawford Co., Aug. 8, July 10, common; Aug. 7, common at Mio, pair nesting; Aug. 15, 19, common; July 5, one shot with egg in ovary; very common. Iosco Co., Aug. 22, common.

35. *Chætura pelagica*. CHIMNEY SWIFT. — Crawford Co., Aug. 8, occasional; Aug. 9, 13, frequent; July 10. Oscoda Co., June 18, occasional; July 3, 15, occasionally seen.

36. *Trochilus colubris*. RUBY-THROATED HUMMINGBIRD. — Crawford Co., Aug. 9, common; Aug. 13, frequent; Sept. 10, one seen.

37. *Tyrannus tyrannus*. KINGBIRD. — Crawford Co., Aug. 9, 13, common; June 30, common; July 16, a nest was seen near Roscommon on top of a four-foot stump; it contained four eggs. Oscoda Co., June 13, Aug. 7, at Mio; Aug. 15, at Butler Bridge; Aug. 19, at Mio, common; July 2, 16, common, nest found. Iosco Co., Aug. 6, 22, common. None seen in Sept., they having probably migrated (Wood).

38. *Myiarchus crinitus*. CRESTED FLYCATCHER. — Oscoda Co., June 14, July 7, Aug. 19, occasional.

39. *Sayornis phœbe*. PHŒBE. — Crawford Co., June 30, July 10, Sept. 12, common. Seen near the bridges along the river, nesting under them. Oscoda Co., June 15, occasional, one evidently nesting under a bridge; July 2, 16, Sept. 13. Alcona Co., Aug. 20, one heard; Sept. 19. Iosco Co., Sept. 21.

40. *Nuttallornis borealis*. OLIVE-SIDED FLYCATCHER. — Crawford Co., June 16, seen on tops of jack pines; Aug. 9, one shot. Oscoda Co., June 18, in tops of tall pines, rare.

41. *Contopus virens*. WOOD PEWEE. — Crawford Co., Aug. 9, 13, common; June 30, July 10, Sept. 6, common. Oscoda Co., June 14, Aug. 15,

19, common; July 2, 15, Sept. 13, common. Alcona Co., Sept. 19. Iosco Co., Aug. 6, at Au Sable; Aug. 22, Sept. 21, common.

42. *Empidonax minimus*. LEAST FLYCATCHER.—Ogemaw Co., June 18, common. Crawford Co., June 30, Sept. 12, July 10. Nest on jack pine bough, 2 fresh eggs, two miles west of North Branch. Oscoda Co., July 3, 15, Sept. 12, common. Alcona Co., Sept. 19, common. Iosco Co., Sept. 21, common.

43. *Otocoris alpestris praticola*. PRAIRIE HORNED LARK.—Oscoda Co., July 10, a few seen on the plains; Sept. 18, a flock seen at McKinley. Breeds on plains back from the river; fairly common.

44. *Cyanocitta cristata*. BLUE JAY.—Crawford Co., Aug. 8, 9, frequent; Aug. 13, common; June 30, Sept. 5, common, breeding in pines. Oscoda Co., June 13, frequent; Aug. 15, common; Aug. 19, frequent; July 2, 16, Sept. 13, very common. Alcona Co., Sept. 19. Iosco Co., Aug. 22, Sept. 20, 21, common.

45. *Corvus brachyrhynchos*. AMERICAN CROW.—Crawford Co., Aug. 13, frequent; June 30, Sept. 6, common; young seen. Oscoda Co., June 13, Aug. 15, frequent; July 2, 16, Sept. 12. Alcona Co., Aug. 20, frequent; Sept. 19, common. Iosco Co., Aug. 22, occasional; Sept. 20, 21, common.

46. *Dolichonyx oryzivorus*. BOBOLINK.—Oscoda Co., July 4. Reported at Luzerne (Royce) as breeding in clover meadows.

47. *Molothrus ater*. COWBIRD.—Crawford Co., June 30, common, young seen. Oscoda Co., June 14, common near Butler Bridge; July 2, 16, common. Not seen in Sept.

48. *Agelaius phoeniceus*. RED-WINGED BLACKBIRD.—Iosco Co., Sept. 19, a large flock seen and heard singing near the river.

49. *Sturnella magna*. MEADOWLARK.—Oscoda Co., July 5, occasional. Reported as breeding in meadows near Luzerne (Royce). Alcona Co., Sept. 19, common in old meadows. Iosco Co., Aug. 6.

50. *Icterus galbula*. BALTIMORE ORIOLE.—Oscoda Co., July 4, Luzerne. Reported breeding by a resident, Mr. O. Royce.

51. *Quiscalus quiscula æneus*.—BRONZED GRACKLE.—Crawford Co., June 16, frequent; Aug. 13, June 30, Sept. 6, common; Sept. 13. Oscoda Co., July 2, 16, common; breeding in pines along the river near Butler Bridge. Alcona Co., Sept. 19, a few seen. Iosco Co., Aug. 6, Aug. 22, frequent; Sept. 21.

52. *Carpodacus purpureus*. PURPLE FINCH.—Oscoda Co., Aug. 15, shot one in scrub oaks, several seen. Iosco Co., Aug. 22, saw one on the river bank.

53. *Loxia curvirostra minor*. AMERICAN CROSSBILL.—Oscoda Co., Aug. 7, at Mio; saw one close at hand, others flying.

54. *Astragalinus tristis*. AMERICAN GOLDFINCH.—Crawford Co., June 16, 30, Aug. 9, 13, common. Saw them on the South Branch. Sept. 6, common. Oscoda Co., June 15, Aug. 15, 19. July 2, 16, Sept. 12, common. Saw them on the North Branch. Alcona Co., Sept. 19, com-

mon. Some in full plumage. Iosco Co., Aug. 6, common. At Au Sable Aug. 22, common; Sept. 20, 21, common.

55. *Spinus pinus*. PINE SISKIN. — Crawford Co., Aug. 12, common; flocks seen passing overhead. Oscoda Co., Aug. 15, occasionally seen.

56. *Poœcetes gramineus*. VESPER SPARROW. — Crawford Co., June 16, frequent among jack pines and low oaks; Aug. 8, common; Aug. 13, frequent; June 30, Sept. 6, common along South Branch of Au Sable, and on the main stream. Oscoda Co., June 13, Aug. 15, common; July 2, 16, Sept. 13, common, breeding. Iosco Co., Sept. 20, 21, common.

57. *Zonotrichia albicollis*. WHITE-THROATED SPARROW. — Crawford Co., June 16, frequent, evidently nesting in a cedar swamp; Aug. 8, 9, 13, frequent; June 30, young seen; Sept. 6. Oscoda Co., June 13, frequent; June 14, nesting; Aug. 7, 16, frequent; July 2, Sept. 12, a few seen. Alcona Co., Aug. 20, occasional.

58. *Spizella monticola*. TREE SPARROW. — Iosco Co., Aug. 6. In flock with Juncos.

59. *Spizella socialis*. CHIPPING SPARROW. — Crawford Co., June 15. Aug. 13, common; June 30, July 15, Sept. 6, North Branch. I found a nest in a small jack pine near the Kirtland Warbler colony (Wood). Oscoda Co., June 13, Aug. 7, at Mio; Aug. 15, common; July 2, 16, common, Butler Bridge. Breeding, young seen. Alcona Co., Sept. 19, common. Iosco Co., Aug. 6, at Au Sable; Sept. 20, 21, very common.

60. *Spizella pusilla*. FIELD SPARROW. — Crawford Co., Aug. 8, common in jack pines; June 17, occasional. Oscoda Co., Aug. 7, frequent, at Mio.

61. *Junco hyemalis*. SLATE-COLORED JUNCO. — Crawford Co., July 10, Sept. 12, common. Oscoda Co., June 15, feeding young; Aug. 15, frequent in jack pines; July 2, 15, common, breeding in the same locality with Kirtland's Warbler (Wood); Sept. 13, 15. Alcona Co., Sept. 19. Iosco Co., Aug. 6, in flock with *Spizella monticola*; Aug. 24, at Au Sable, frequent; Sept. 20, 21, common.

62. *Melospiza cinerea melodia*. SONG SPARROW. — Crawford Co., June 16, common, shot young; Aug. 8, 9, 13, common; June 30, common; seen on South Branch; Sept. 6, common. Oscoda Co., June 13, common; Aug. 15, frequent. July 2, Sept. 12, common. Breeding in vicinity of the Kirtland Warbler colony (Wood). Alcona Co., Aug. 19, Sept. 19, common. Iosco Co., Aug. 6, Au Sable; Aug. 22, Sept. 20, 21, common.

63. *Melospiza lincolni*. LINCOLN'S SPARROW. — Crawford Co., Sept. 6. I saw one a few miles east of Grayling on the edge of the Au Sable River in thick brush, evidently on its way south (Wood).

64. *Pipilo erythrophthalmus*. TOWHEE. — Crawford Co., Aug. 8, 9, common; Aug. 13, frequent; Sept. 6, June 30, common; breeds in same locality as Kirtland's Warbler (Wood). Oscoda Co., June 13, July 2, 15, Aug. 15, Sept. 13, common. Alcona Co., Sept. 19. Iosco Co., Aug. 22, Sept. 20, 22, common.

65. *Zamelodia ludoviciana*. ROSE-BREASTED GROSBEAK. — Crawford

Co., Aug. 9, occasional. Oscoda Co., June 14, occasional; Aug. 15, 19, frequent.

66. *Cyanospiza cyanea*. INDIGO BUNTING.—Oscoda Co., Aug. 16, one pair nesting.

67. *Piranga erythromelas*. SCARLET TANAGER.—Oscoda Co., July 2, 15, occasional. Reported as seen near Luzerne by O. Royce. Alcona Co., Aug. 20, heard one in a swamp. Iosco Co., Aug. 21, shot a female; Aug. 22.

68. *Progne subis*. PURPLE MARTIN.—Iosco Co., at Au Sable, only observed at the mouth of the river.

69. *Hirundo erythrogastra*. BARN SWALLOW.—Crawford Co., July 1, a few seen. Oscoda Co., July 5, occasionally seen about old barns.

70. *Riparia riparia*. BANK SWALLOW.—Crawford Co., Aug. 9, frequent; June 30, occasional. A few seen on South Branch. Oscoda Co., July 2, 15, occasional. Nests were seen all along the river in the steep banks, just beneath the sod (Frothingham). Common all along the river; none seen in September (Wood).

71. *Ampelis cedrorum*. CEDAR WAXWING.—Crawford Co., Aug. 9, 13, common; June 30, common on South Branch; Sept. 6, common. Oscoda Co., June 14, July 2, Aug. 15, 19, Sept. 6, common. Alcona Co., Sept. 19, occasional. Iosco Co., Aug. 22, frequent; Sept. 20, 21, occasional.

Cedar birds were very common along the upper waters in August. They perched like flycatchers on dead limbs overhanging the water, making zig-zag excursions now and then whose object seemed to be catching insects. The birds decreased in numbers as we neared the south bend of the river, though they were of quite frequent occurrence all the way down (Frothingham). Seen all along the river (Wood).

72. *Lanius ludovicianus migrans*. MIGRANT SHRIKE.—Oscoda Co., July 2, 15; five young shot and nest taken on Jack Pine Plain $\frac{1}{2}$ mile south of river near Butler Bridge. July 4, one shot near Mio by Dr. W. B. Hinsdale who also saw several more.

73. *Vireo olivaceus*. RED-EYED VIREO.—Crawford Co., Aug. 8, common; Sept. 8, occasional. Oscoda Co., June 13, frequent; Aug. 15, 19, common; July 10, occasional. Iosco Co., Aug. 6, common.

74. *Vireo gilvus*. WARBLING VIREO.—Crawford Co., June 30, on the South Branch; rare.

75. *Vireo flavifrons*. YELLOW-THROATED VIREO.—Alcona Co., Sept. 20, one shot near bank of Au Sable by Prof. J. E. Reighard.

76. *Mniotilta varia*. BLACK AND WHITE WARBLER.—Crawford Co., Aug. 9, occasional; July 15, one young seen on Big Creek. Oscoda Co., June 18, female shot in hardwood swamp; Sept. 10.

77. *Helminthophila ruficapilla*. NASHVILLE WARBLER.—Crawford Co., Aug. 10, occasional, in swamp, with berry-bushes and poplars. Oscoda Co., June 18, frequent on low old-pine land. Aug. 16, frequent; a family seen.

78. *Helminthophila peregrina*. TENNESSEE WARBLER.—Crawford Co., Sept. 6, one seen a few miles east of Grayling, at the edge of the river, probably migrating (Wood).

79. *Dendroica aestiva*. YELLOW WARBLER.—Crawford Co., Aug. 9, occasional, song heard; June 29, South Branch. occasional.

80. *Dendroica caerulescens*. BLACK-THROATED BLUE WARBLER.—Crawford Co., Sept. 9, one shot at Stevens Camp, eight miles east of Grayling. Not common. Saw this warbler in Ogemaw Co., five miles north of West Branch, June 19, in hardwoods; probably breeding (Frothingham).

81. *Dendroica coronata*. MYRTLE WARBLER.—Crawford Co., Sept. 6, occasionally seen; probably on its way south. Oscoda Co., Aug. 15, shot a moulting female, the only one seen, in a swamp of white pine, etc.

82. *Dendroica pensylvanica*. CHESTNUT-SIDED WARBLER.—Crawford Co., Aug. 10, pair seen feeding young. Oscoda Co., June 18, one male seen.

83. *Dendroica Blackburniae*. BLACKBURNIAN WARBLER.—Oscoda Co., Aug. 17, one male seen.

84. *Dendroica virens*. BLACK-THROATED GREEN WARBLER.—Crawford Co., Aug. 10, a family seen at Camp Douglas on the South Branch. Oscoda Co., Aug. 15, saw family in swamp of birch, white pine, alder and dogwood; June 18, frequent. Iosco Co., Aug. 6, saw family in jack pines two miles from Oscoda; Aug. 24, common, old and young, in same pines. Sept. 20, 21, common.

85. *Dendroica kirtlandi*. KIRTLAND'S WARBLER.—Crawford Co., July 8, one shot (Wood); July 9, three seen (Wood); July 10, one shot (Wood); July 11, two shot (Wood); July 13, two shot (Wood); July 15, male shot (T. G. Gale); June 15, several seen and songs heard (Frothingham). Oscoda Co., July 2, one shot (Wood); July 7, one shot (Wood); July 7, several seen and heard (Wood). Breeds. Two nests taken in July with egg and young (Wood).

86. *Seiurus aurocapillus*. OVEN BIRD.—Crawford Co., Aug. 11, frequent at Camp Douglas; June 29, 30, at Camp Douglas. Oscoda Co., June 13, frequent; July 2, 16, common. Iosco Co., Aug. 24, saw one in jack pines at Oscoda.

87. *Geothlypis trichas*. MARYLAND YELLOW-THROAT.—Crawford Co., Aug. 9, 13, frequent; July 1-12, breeding at the edge of a swamp where I heard them singing every day (Wood); Sept. 6, occasional. Oscoda Co., June 13, 18, frequent; Sept. 9, a female seen.

88. *Setophaga ruticilla*. AMERICAN REDSTART.—Crawford Co., Aug. 9, frequent; June 31. Oscoda Co., July 1, occasionally seen; Sept. 7, not very common. Saw and heard a male singing in hardwoods five miles north of West Branch, Ogemaw Co., on June 19 (Frothingham).

89. *Galeoscoptes carolinensis*. CATBIRD.—Crawford Co., June 15, Aug. 8, 9, 13, frequent; July 1, Sept. 5, common; breeds; young seen.

Oscoda Co., Aug. 15, frequent; July 2, 15, Sept. 13. Alcona Co., Sept. 19. Iosco Co., Sept. 20, 21.

90. *Toxostoma rufum*. BROWN THRASHER.—Crawford Co., June 15, young and adult seen; Aug. 8, 9, 13, frequent; June 29, frequent; Sept. 6. Common, breeds on plains. Oscoda Co., Aug. 15, frequent; July 2, 15. Alcona Co., Sept. 19. Iosco Co., Sept. 20, 21, common.

92. *Troglodytes aëdon*. HOUSE WREN.—Crawford Co., June 29, occasional, near Grayling, probably breeding. Iosco Co., Aug. 6; frequent at Au Sable.

93. *Olbiorchilus hiemalis*. WINTER WREN.—Crawford Co., Aug. 9, occasional; July 1, one seen near Roscommon; breeds in the slashings. Oscoda Co., Aug. 17, frequent.

93. *Certhia familiaris americana*. BROWN CREEPER.—Oscoda Co., rare; July 4, one shot; a few probably breed; young seen.

94. *Sitta carolinensis*. WHITE-BREASTED NUTHATCH.—Crawford Co., Aug. 10, Sept. 6, July 11, frequent, young seen; Aug. 19, Sept. 17, July 2, frequent. Alcona Co., Sept. 19. Iosco Co., Aug. 22, Sept. 20, 21, frequent.

95. *Sitta canadensis*. RED-BREASTED NUTHATCH.—Oscoda Co., Sept. 17, one shot; July 4, one shot. Saw them in jack and Norway pines; common. Iosco Co., Aug. 24, saw five or six in jack pines with Chickadees.

96. *Parus atricapillus*. CHICKADEE.—Crawford Co., Aug. 9, 13, common; July 1, Sept. 5, common. In pines; breeds, young birds seen. Oscoda Co., June 14, Aug. 15, 19, Sept. 13, common; July 2, 15. Alcona Co., Sept. 19. Iosco Co., Aug. 6, 24, common at Au Sable; Aug. 22, Sept. 20, 21, common.

97. *Regulus satrapa*. GOLDEN-CROWNED KINGLET.—Crawford Co., Sept. 6, occasionally seen, probably migrating.

98. *Polioptila caerulea*. BLUE-GRAY GNATCATCHER.—Crawford Co., Aug. 10, two seen.

99. *Hylocichla mustelina*. WOOD THRUSH.—Crawford Co., Sept. 9, one seen at Steven's Camp, eight miles east of Grayling. Oscoda Co., July 4, 15, common.

100. *Hylocichla fuscescens*. WILSON'S THRUSH.—Oscoda Co., July 6, 15, occasionally seen.

101. *Hylocichla guttata pallasii*. HERMIT THRUSH.—Crawford Co., Aug. 11, frequent; July 1, occasional on South Branch; Sept. 6, occasional. Oscoda Co., June 14, frequent; July 11, frequently seen and heard. Saw a number of thrushes on the upper waters but was unable to identify them. Shot a young of this species (probably) at Butler Bridge on Aug. 17. Oscoda Co. (Frothingham).

102. *Merula migratoria*. AMERICAN ROBIN.—Crawford Co., June 17, July 1, 11, Aug. 9, 13, Sept. 6–12, common. Oscoda Co., June 13, July 2, Aug. 7, 15, 19, at Mio, Sept. 13, common. Alcona Co., Sept. 20, Aug. 22. Iosco Co., Aug. 6, Sept. 21, 22. This bird was one of the most common species.

103. *Sialia sialis*. BLUEBIRD. — Crawford Co., Sept. 12, saw a number in the Kirtland Warbler region (Wood). Oscoda Co., June 13, Aug. 17, occasional; July 6, frequent; Sept. 12, very common, breeding, young seen. Alcona Co., Aug. 19, frequent. Iosco Co., Aug. 22, frequent.

UNIVERSITY MUSEUM, UNIV. OF MICHIGAN,
October, 1904.

REGURGITATIVE FEEDING OF NESTLINGS.

BY IRENE G. WHEELOCK.¹

My claim upon your attention this morning lies in the fact that many years of field work, averaging three to five months each year, have been spent about equally divided between California and Illinois in obtaining the data which I shall present for your consideration. I am confident that it is accurate, and I believe that it is new. The field is large, it is practically unworked, and it offers a rich opportunity for original research.

Realizing that there is time to present only a small proportion of the mass of data at hand, I will pack facts closely and select from my records species representing as many families as possible. Of course it is necessary to record many broods of each species before we can claim that any peculiarity observed is a habit of that species. Having records of one hundred and eighty-seven broods (*not species*), I claim that every brood hatched in a naked or semi-naked condition was fed by regurgitation from a period varying from one day to four weeks. To those critics who believe that their own observations prove this statement untrue I would address two questions: First, *Have you determined accurately the age of the brood at the date of the record?* Because some birds regurgitate for one day only.

Second, *Just what is understood by "Regurgitation?"* As defined by Worcester, Webster and others it means "a flowing back," and

¹ Read at the Twenty-second Congress of the American Ornithologists' Union, Cambridge, Mass., November 29, 1904.

in this sense I use the term. It does not always imply pre digestion. It refers only to food that has been swallowed by the adult and carried in the crop to the young. Oftentimes there is no appreciable digestion of the raw material, as when a Cedar Waxwing swallows choke cherries and two minutes later disgorges them one by one into the mouth of the nearly fledged nestlings; or when the Nighthawk comes with throat full of fireflies and, according to Mr. Herrick, pumps the young full of the glowing mass; or when the Flicker empties her sack full of ant larvæ into the eager throat of her hungry offspring. An examination of the crops of the young immediately after feeding, in each of these cases, reveals food in a comparatively fresh condition except for a certain sliminess caused by the saliva of the adult. But, although the result in each of these instances is the same, the methods differ widely. For instance, the Waxwing simply fed the cherries one at a time exactly as he might have done had he brought each one singly. Yet we all accept the fact that the cherries were carried in his throat and consequently were *regurgitated*. The Nighthawk (I cite from Mr. Herrick) placed her capacious bill over, not in, that of the little one and allowed the contents of her throat to escape into the gullet of the nestling. But Mr. Herrick does not hesitate to pronounce this act *regurgitation*. The long, flabby throat of the young Flicker, on the other hand, requires some further help in swallowing, and hence the shaking process so distressing to witness. But I wish to emphasize the fact that *this elaborate process is no more truly regurgitation than is the quick ejection of food in the case of the Cedar Waxwing*.—The three cases cited, although differing so widely from each other, are unhesitatingly accepted by all scientists as examples of regurgitative feeding. All the instances I have recorded follow one of these three modes.

In obtaining this data several methods have been followed. In about one third of the instances it was possible to watch at close range, concealed either in ambush or by protective coloring in dress and by patience in remaining motionless. By close range I mean from ten to forty feet. With field glasses forty feet is practically two feet.

In cases where such watching was obviously impossible from the position of the nest or the intervening foliage, I was obliged to

be content with investigating the crops of the nestlings immediately after feeding. *This was done in all cases whether watched at close range or not.* As soon as possible after the parent bird had given the meal and left the brood, we took one of the little ones up and by touching it gently with a feather induced it to open its bill. Unless fed to a surfeit the nestling responded eagerly; and the feather, trimmed to a blunt point, was thrust into the throat, turned once and withdrawn. Usually sufficient food adhered to it to be placed on a slide and examined under a microscope if necessary. Whenever it was found impracticable to insert the feather we forced the young bird to disgorge by a slight pressure on the gullet. Often the skin of the crop was so distended and so transparent that it was possible to judge of the condition of its contents from an external examination. Usually the internal examinations were limited to one a day for each young bird.

Just here let me call your attention to a few salient points. First.—In every case offered in evidence the record begins on the day of hatching. *Data obtained without knowledge of the exact age of the young birds is incomplete,* and while more or less valuable is not sufficiently reliable to be used here.

Second.—That in every case the crops of the young were examined within five minutes, usually within two minutes after feeding was completed, and before any digestive process could have taken place in the throat of the young. This is a most important point — *that the examination of the crop was made before any digestion by the nestling could have been under way;* hence whatever state of digestion the food showed must have been effected in the throat of the adult before it was given to the young. Moreover, as soon as any food was given in a fresh condition by the adult the fact was at once apparent in the examination. In order to note the rapidity of digestion, I experimented with a brood of Thurber Juncos by feeding them fresh food and examining the contents of the crop at ten minutes afterward. There was practically no change in form and but slight change in substance, it being a trifle softer, and more slimy. The same experiment was tried with young Robins with the same result. In the case of Crows and Blue Jays digestion was somewhat more rapid.

The first brood that I recorded as feeding by regurgitation was

that of a caged German Canary. Hard boiled egg was swallowed by the adult and in about six minutes was passed on to the young in the form of a white mass resembling very moist library paste. This process was continued until the eyes were open and the pinfeathers showed plainly. American Goldfinches (*Astragalinus tristis*) nesting in July in the crotch of a sapling at Glencoe, Illinois, were next watched and fed their young by regurgitation of husked and partly digested seeds of the thistle. It was possible to see the food given and an examination of the crops immediately afterwards proved its character. It looked like cooked farina. These birds were fed by regurgitation during the entire period of remaining in the nest. Toward the last the character of the food changed in being less affected by digestion of the adult, that is, less mushy and glutinous, but the seeds were always hulled and softened, probably with saliva of the adult.

The nest of a Vesper Sparrow (*Poæcetes gramineus*) was discovered May first on the ground on a bare sandy knoll in a field at Evanston, Illinois. Sparse grass blades and thin lichen-like moss covered the earth, and in a slight hollow at the root of a clump of wild strawberries lay the nest. It contained three sparrow eggs and two eggs of the Cowbird, all of which hatched the next day. I removed the Cowbird's. By crouching behind bushes at the foot of a tree twenty feet distant, it was possible to see much that took place at the nest. The parent birds were fully aware of my presence and the male flew scolding to a branch in my view with a large insect in his bill. As soon as he fancied that he had attracted my attention to himself he dodged down behind a weed about thirty feet from the nest site, swallowed the bug and reappeared with a great show of courage. I turned from watching him just in time to see the female sneaking away from the real nest and knew that she had fed the little ones. An examination of their crops showed the contents to be a slimy mass, pale cream in color, evidently vegetable matter. Examination after subsequent feedings proved the food to be largely weed seeds, always hulled and partly digested. On the third day the larvæ of some insects unknown to me, macerated soft parts of grasshoppers and spiders, all partially digested, were found in the crops at different times. One of the examinations made on the

fourth day revealed part of a grasshopper in a nearly fresh condition. Evidently, feeding by regurgitation was giving place to fresh food. But the next feeding was by regurgitation again. By the morning of this day (the fourth) the little slits between the eyelids were well open and pin-feathers were showing along the feather tracks. All feedings recorded on the sixth day were of fresh food, mostly insects. No record was kept after the sixth day.

A pair of Chipping Sparrows (*Spizella socialis*) nesting in a thornbush at Cedar Lake, Indiana, May 16, were surprisingly bold in living their home life under our close surveillance. The wee brown mother allowed me to touch her when brooding her eggs, and after the tiny bits of bird life were hatched she fed them, by regurgitation, within four or five feet of the watchers, eight times in two hours. The unusually small amount of food found in the gullet of the young, however, convinced me that the meals were given too hastily for the best interests of all concerned. For the first two days the contents seemed to be soft, creamy white, very much like that fed the young canaries described previously. I am free to confess that all inspection of the food in this case was external only; for, so tiny were the nestlings and so thin the skin of their throats that I feared to use even the feather test lest I injure the delicate membrane. However, the actions of both adults at the nest could not be mistaken. After alighting on or near the edge, the one who had come to feed the young would seem to look at them for some seconds as if trying to decide which one to supply first. This is the interpretation often given by popular writers, *but the real cause of hesitation is shown in the swelling of the throat as the food rises to be disgorged.* As soon as all is ready, the act of feeding is too quick for even an 'instantaneous' to catch. Mr. Ned Dearborn, whose part in that valuable work 'Birds in their Relation to Man' is well known to you, is the only one I know of who has succeeded in photographing it. He has two fine negatives of the Goldfinches feeding by regurgitation, but for this one success has hundreds of failures to report. As for the Chipping Sparrows, a camera record of the act is, I believe, impossible. It is quicker when the food is regurgitated than later when fresh insects are brought, which must be

tucked carefully down into the throat and watched until they disappear.

In the case of the Chipping Sparrows, the first bit of fresh food recorded was a spider given on the afternoon of the fifth day. At this time the eyes were able to open and feathers were forming, though showing merely as dark hues along the feather tract. After this, the food consisted largely of grasshoppers, smooth caterpillars and a few moths.

A nest of Thurber Juncos (*Junco oreganus thurberi*) snugly hidden under the edge of a decayed log at Mt. Tallac in the Sierra Nevada Mountains, proved a most interesting find and added much valuable data for the finch family. So shy were the adults that it was impossible to watch the feeding from a nearer distance than thirty feet, and the protective color of both parents blending with the brown pine needles surrounding the nest greatly increased the difficulty. In these circumstances I was obliged to depend largely upon the condition of the food found in the crop of the young to prove the method of feeding. On the day of hatching, June 11, fifteen feedings by regurgitation took place between 8 and 11 A. M. During this period I examined the crops five times within three minutes after feeding, — that is, each nestling was examined once. In every case the food was found to be partially digested, forming a grayish, slimy mass mixed with darker. Only one of the five crops showed seeds; the others, insects. During the second day the meals were more frequent and in two hours, from 9 to 11 A. M., the male came to the nest six and the female eight times. From 1 to 2 P. M. there were eleven feedings. Examination of the crops showed the same condition as on the previous day. There was no record on the third day. The fourth day differed from the first and second days in the large amount of vegetable matter found in the food, and also because four of the fourteen feedings recorded on this day were of fresh food. The vegetable matter found in the crops was small, round, highly mucilaginous seeds from some weed unknown to me. The fresh food consisted of large insects which had been carefully denuded of wings and legs before being given to the young. On the fifth day all food given was fresh,—that is, unregurgitated; feathers were commencing to show and the

eyes were open. On the sixth day, being compelled to leave that vicinity, I kidnapped two of the young Juncos and bringing them across the divide completed the study in Chicago.

Among the thrush family the American Robin (*Merula migratoria*) first claims our attention from its commonness. The pair whose record I offer you nested at the top of a trellis under the eaves of a veranda at my home, and in unobstructed view from a window five feet away. It was their third season in that dooryard and they paid no attention to the observers at the window, and, after the first day, made little protest against examination of the young.

On the first day, the crops of the nestlings contained balls of partially digested earth worms and white grubs, very jelly-like and with much saliva. On the second day, the food was of the same character but mixed with darker masses which seemed to be the abdomen of spiders; no legs or other hard portions were found in it, however, until the third day, when two bits of spider legs and balls of grass were discovered. Early on the morning of the fourth day an earth worm, thoroughly macerated, was given fresh to one of the nestlings. This was the first fresh food I had seen given. During the fourth day the food was all administered in a fresh state, and consisted of earth worms, grass, grubs and various species of insects. It was warm, wet, April weather and earth worms were the most abundant food, which doubtless accounts for their occurring in such quantities in the food of the young. June broods that I have recorded have more often fed upon fruit, caterpillars and grasshoppers.

Bluebirds, nesting for several seasons in the same deserted woodpecker's hole in an old tree on our lawn, furnished data for the statement that their young are fed by regurgitation until the fourth day, when this is varied with fresh food for a day; but, from the sixth day on, all the food given is in a fresh state. Insects and bits of grass formed the entire supply.

The Wood Thrush was found to resemble the Robin closely in nesting habits, but its bill of fare is more like that of other thrush, the Bluebird. The young were fed by regurgitation for three days on soft parts of insects, crushed and swallowed by the adults, but only partially digested.

In the thrasher family records were made of the Brown Thrasher (*Toxostoma rufum*) and the Catbird (*Galeoscoptes carolinensis*). The nesting habits of these two species are very similar. The difference lies chiefly in the large amount of fruit eaten by the Catbird. This was especially apparent in the crops of the nestlings, even in the first two days when feeding was entirely by regurgitation. The young Thrashers had been fed upon ants and spiders chiefly, while the Catbird nestlings, recorded at the same date, May 30, showed traces of strawberries, beetles, and larvæ of insects.

As if to assist in my collection of hitherto inaccessible data, a pair of Baltimore Orioles (*Icterus galbula*) swung their cradle over a third story balcony of a residence occupied by interested friends who at once notified me. The house stood on one of Chicago's busiest residence streets, but the birds reared their brood unmolested by anyone save a meddlesome bird lover who insisted upon knowing all that took place in the nursery and exactly what food was given the young orioles. On the first day, feeding by regurgitation took place at intervals averaging twenty minutes for each nestling. As the nest was not more than three feet from the window, it was possible to watch just what was being done and to make examination of the young as often as seemed expedient. One particularly noticeable fact was that the female came to the nest much more freely than the male, and fully twice as often. Also, she invariably turned her back to the observer, shielding the young from sight with her body, while the male alighted as far from the window as possible and fed by little pecks with one eye constantly on us. The food given was the soft part of grasshoppers and dragon flies, and the larvæ of different species of insects mixed with green leaves,—all thoroughly macerated and partially digested. No traces of fruit were found. On the third day, the male was seen to give the soft part of a dragon fly, having removed the wings in full view of the observer, without first swallowing it himself. After the fourth day all food recorded was given in a fresh condition. In the case of this brood no fruit was fed the nestlings, possibly because of the difficulty of procuring it.

Among other members of this family, Brewer Blackbirds (*Euphagus cyanocephalus*) in California and both Red-winged (*Agelaius*

phaeniceus) and Yellow-headed Blackbirds (*Xanthocephalus xanthocephalus*) in Wisconsin were recorded; and, in the case of the Yellow-head, the nest was removed from its original site to one better adapted for observation. The food habits of these three species are so similar as to be nearly identical. The young are fed by regurgitation for two days, afterwards by both methods for two days, then entirely by fresh food. Examination of the crops of the broods reared in late June showed, on the first day, snails, waterslugs and larvæ all partially digested. On the second day, insects denuded of wings, legs, and all hard parts, and thoroughly crushed as well as predigested, were found mixed with occasional water moss. The third day showed little change in the menu but the food was less digested and, on this day, occasional meals of fresh food began to supplant the regurgitated.

Meadowlarks, both the western (*Sturnella magna neglecta*) in California and the eastern (*Sturnella magna*) in Illinois, were recorded. They feed by regurgitation for three days, gradually giving fresh food until by the fifth day all food is fresh.

In most parts of the Sierra Nevada Mountains, Pigmy Nuthatches (*Sitta pygmaea*) are very abundant and seem to be absolutely without fear. One pair, nesting in a pine stump, went in and out their small doorway even while my eager fingers were trying to enlarge it and scrambled over my hand repeatedly in so doing. In this case there were newly hatched young in the nest; and, as the adults went inside to feed them not more than two feet from my eyes, I was able to see perfectly that the food was carried in the throat. Of course this could only mean regurgitation; but not until the third day could I get at the nestlings to examine the crops. The contents consisted of larvæ of insects and ant eggs, all partially digested. On the fifth day the examination indicated the presence of fresh or unregurgitated insect and grass food. On the sixth day most of the food given was fresh, but on two occasions the adults visited the nests with no visible supply in the bills. No record was kept of this brood after the sixth day. Two other broods of this species were recorded at the same place and with practically the same results. The interval between feedings shortened with the increasing age of the nestlings and on the last day of the record twenty-eight meals were served by one pair

between eight and ten-thirty A. M. as contrasted with seventeen in the same length of time on the day of hatching.

Slender-billed Nuthatches (*Sitta carolinensis aculeata*) are so much shyer than their small relatives, the Pygmies, that they are much more difficult to observe. A nest found in an old woodpecker hole twenty feet from the ground at Romardennan, California, May 3, contained five eggs just ready to hatch. On May 5, four nestlings and one infertile egg were found in it. Feedings by regurgitation took place for one day only, and the contents of the crops were insect eggs and larvæ. The parents resented our meddling after this examination and did not come to the nest again for more than two hours. On the second day, to my great surprise, one of the adults brought a grub in his bill thus showing plainly that fresh food was being given. Unfortunately for the record either my investigations caused the Nuthatches to desert their brood, or both parents fell victims to a collector; for the third day found only the lifeless bodies of the young in the nest and no sign of the adults about the place.

For many years I had watched in the vain effort to obtain a complete record of some species of Tanager. Nests in abundance we had found, both of the Scarlet and Summer Tanager of the East and the Louisiana Tanager in California, but so inaccessible were they as to make accurate data impossible. Of three nests of the Scarlet Tanager (*Piranga erythromelas*) within watching range, two were deserted before incubation,— one because a Cowbird laid her eggs in it, one because of our meddling. The third, in a tangle of wild grapevine at the foot of a bluff, with Lake Michigan dashing spray over it at every easterly gale, was the only one to fulfill our hopes. It was a curious location for both nest and grapevine, and we could hardly credit our good luck when we stumbled upon it in descending from the Cliff Swallows seventy-five feet above. It contained, July 2, four eggs which hatched two days later. The old birds were very shy, refusing to come to the vicinity when any watcher was in sight. We could keep no record of the visits of the female because of her protective coloring; but, concealed in a deserted bathhouse, we were able to see the bright gleam of scarlet as the male came to and left the nest. An examination of the young, immediately after his departure on the first day, showed

their crops full of insect food in advanced digestion. Two subsequent examinations gave the same result. It differed in no respect from results of similar examinations of young broods which we had watched at close range while they were being fed by regurgitation. On the second day, by burying myself in the sand and covering head and shoulders with a tree branch, I managed to see both parents feed the young. There was the same hesitation, the same swelling of the throat, and the same quick pouring of the food into the open bill of the nestling, that we had seen in the case of all the perching birds during the first few days of feeding their young. The examination, however, revealed insect food of a dark color. I recorded it as ants, with a question mark. Whether our watching had exposed this brood to other meddlers, or whether the parents deserted them, I know not; but the third day found the nest empty, and the record is only valuable as establishing the feeding habits of the first three days. I offer it hoping someone may take up the clew and obtain fuller results.

One of the most interesting of the Swallow records is that of a pair who plastered their mud nest under the eaves of a bungalow at Lake Pewaukee in Wisconsin. Standing on the ground I could reach into the nest and, but for the overhanging eaves, could have looked into it. The location was much more like a Phoebe's nesting site, yet the housekeepers were Cliff Swallows (*Petrochelidon lunifrons*). The young were hatched on July 10, and were larger in proportion to the size of the adults than any nestlings I have seen, except young Purple Martins. From early morning until after sunset the parents were busily flitting to and fro over the marshy land and bringing their harvest of gnats to the little ones. No tent was necessary to watch this brood. Their home life was carried on with the utmost freedom while I sat hour after hour within five feet of the nest. In this they were like the Purple Martins again, who insisted upon entering the nest hole with food while I was reaching in for the young. On the first day, the young Eave Swallows received forty-six meals in three and one half hours, all by regurgitation. The adult never failed to alight on the edge of the pocket shaped nest in such a way as to stand between me and the young so that I could not see exactly what took place. After waiting several seconds, the parent leaned over

quickly and delivered the food it had brought in its throat. Twelve examinations of the craws were made on the first day and fourteen on the second day. The only difference was in the slightly more solid condition of the food on the second day. Ants, gnats and small flies had been given, all partially digested and mixed with an unusual amount of saliva. Large insects were brought at intervals on the afternoon of the fourth day, but toward night the feedings by regurgitation were resumed. This was proved by the change in the character of the food found in the craw as well as by noting the condition of the adults' throat and bill as they came to the nest. At this time the heads and backs of the young were covered with a thin down, the skin had turned darker and the eyes were commencing to open.

On the sixth day ten regurgitative feedings and sixteen fresh meals were recorded in two hours from four to six P. M. There was no further record until the tenth day when four regurgitative and eleven fresh feedings were given in one hour from four to five P. M. On the eleventh day this brood came to an untimely end through the fall of the nest in a hard rain storm, and the record was not finished until 1901, when I saw another brood fed by regurgitation on the day of leaving the nest.

Study of the nesting habits of a Hutton Vireo (*Vireo huttoni*) at San Jose, California, proved to me how like this western species is to his eastern cousin, the Warbling. The records of the two are almost identical. The dainty cradle of the Hutton Vireo was swung from the lower branches of a sapling less than seven feet from the ground on the side of a hill. By sitting opposite and a few feet higher I was able to see most that went on in the vireo household. The four eggs, hatched May 14, had been incubated only eight days. At ten A. M., when I began the record, both adults were busy supplying food to the young and, during two hours, visited the nest sixteen times, brooding a good deal between times. Every feeding was by regurgitation. External examination of the crops showed the thin, pasty contents usual on the first day. I can describe this in no better way than to say it is like thin, whitish library paste, occasionally streaked with darker color.

On the second day, May 15, meals were given by regurgitation nineteen times between ten and twelve A. M. The nestlings,

seemed to have more than doubled in size and their crops plainly indicated a darker color of the contents than on the day before. The feather test was used in this examination and revealed a slimy formless substance too far digested to be identified. As usual, this examination was made immediately after the young had been fed, and the result would seem to indicate that Vireos digest the food more thoroughly before regurgitation than do most birds. On the third day, the first meal of fresh food was recorded at 10:30 A. M. It was a large spider and was plainly visible in the bill of the adult. At 10:47, a feeding by regurgitation took place with two nestlings and examination showed that it consisted of small insects. At 10:52, another spider was given and at 11:10, several small worms were brought as food. At 11:35 the entire brood were given something by regurgitation. Examination of the crops made me suspect that this was water, for only a fluid was apparent. During the afternoon of the third day, feedings recorded were by regurgitation. When four days old the young vireos were still quite naked, only a thin down covering their upper parts, and their eyes were just beginning to open. On this day they were fed both by regurgitation and fresh food. The contents of the crops revealed spiders, caterpillars, beetles and small insects, both partially digested and fresh. Of eighteen feedings in two hours, eleven were by regurgitation. On the fifth day only one regurgitative feeding was recorded, and from this time on all feedings were of fresh food.

On page 126 of Prof. Weed's 'Birds in Relation to Man' he quotes Prof. Herrick as saying of a brood of Red-eyed Vireos: "On the third day the mother brought a ripe red raspberry, its juice fairly streaming down her bill." Prof. Herrick's statement occurs on page 68 of his 'Home Life of Wild Birds' and is correctly quoted except that the *third day* referred to is the third day of Prof. Herrick's record, not of the life of the vireos. He says that the young vireos were four or five days old when he began to watch them and, consequently, they were seven or eight days old when this red raspberry was brought. In the three vireo broods I have recorded, no fruit was found in the crops until the sixth day when, in the case of the Red-eyed, two blueberries were discovered. Cassin Vireos whom I recorded, were fed bits of leaves,

whether accidentally or otherwise, but I never found any trace of fruit in the crops.

More interesting than the Waxwings, because less common, is its western cousin, the Phainopepla (*Phainopepla nitens*). In feeding and nesting habits these birds are so like the Waxwings that they may be taken as a type of both branches of the family. The brood whose record I offer here were hatched on June 2 in a nest built by the male in an old oak tree near Pasadena, California. They were naked except for a thin covering of down on head and back, and were about the size of newly hatched Red-winged Blackbirds, which they also resemble in color. The adult Phainopeplas were soon reconciled to the presence of a motionless observer, and came to the nest freely after the first few hours. On the first day, sixty-eight meals were recorded between one and six P. M., and all by regurgitation. The adults alighted on the edge of the nest with the gullet visibly swollen and, after a moment of waiting, fed the little ones in the same manner recorded of the Waxwings.

On the second day, in three and one half hours, the male brought food twenty-eight times and the female twenty-one times. The third and fourth days registered an increased frequency in the visits of the male, on an average about two out of three meals being given by him, and all feedings by both parents were regurgitative. The intervals of feeding varied with the time of day, being shortest early in the morning when they were sometimes only five minutes apart.

For the first four days the craw showed only insect food, always in a partially digested condition; but on the fifth day at least one feeding was of pepper tree berries regurgitated in a fairly fresh state. From the sixth day on, part of the meals were regurgitated and part not. Large insects were given fresh; berries by eructation. The craws were examined once a day until the nestlings were twelve days old when, on leaving that locality, I was obliged to close the record. Up to that time the contents showed large insects and berries of various sorts, in about equal proportions.

California Bush-Tits (*Psaltiriparus minimus californicus*) are about the most fascinating feathered mites of my acquaintance. A paper twice as long as this could not do justice to all their tricks and

manners. In some localities they are as common as Bluebirds in Illinois, and no bird is more easily observed. The pair of this record nested in an evergreen tree near the reservoir of Elysian Park, Los Angeles. On the day of hatching, as soon as the young were fed, we cut a slit in the nest and investigated. The adults are scarcely as large as Kinglets and the nestlings were about the size of a bumblebee, certainly less than an inch long. Obviously any thorough examination of the crops was impossible, but its external appearance was like that of the German Canary, soft, creamy and yellowish in color. Whatever the food, it was nearly digested when given. For four days a diligent watch was kept and not once was any visible food brought to the nest. No record on the fifth day. On the sixth day, a second examination revealed crops full of insect food partially digested. On this day also we saw one of the adults bring a grub to the nest. The eyes were now open and the skin was covered with down. No record was kept of this brood after the sixth day. In the crops of other broods, which were feathered and ready to leave the nest, we found insect eggs, grubs and caterpillars. In the case of the first brood mentioned, feeding was surprisingly frequent, the thirty meals in two and a half hours being the highest I have recorded of any species.

The habits of the Sapsuckers are typified by a pair of Williamson Sapsuckers (*Sphyrapicus thyroideus*) of California whose record I now offer you. Half way up from the ground, in a burned pine stump, was the entrance to the nest and easily accessible to the small boy climber who was my chief aid. Sometime before this I had discovered a nest similarly located but nearer the ground, and had found the adults so shy that I had not kept a record of them, fearing a repetition of the Slender-billed Nuthatch tragedy. But the second pair of Williamsons were resigned to their fate. With scarcely a scolding protest they fled, leaving us to investigate and returned as soon as we had gone. It was May 24 when the eggs hatched, and five naked nestlings lay cuddled together on the hard wood of the nest. At the first absence from home of the adults, two of the young were lowered to me for investigation. They had just been fed and were surfeited. The contents of the crops were thick fluid, very sticky, as indicated by the inserted

feather. Both adults came to the nest at frequent intervals throughout the first day, but never with any food visible in bill. These conditions continued up to the eighth day when the first trace of fresh solid appeared in the crops. By this time the adults were sufficiently brave to come to the nest with us in sight, fifty feet away. On the ninth day the female was seen to bring insects eleven times and the male six times, the other feedings being from food carried in the gullet. The young sapsuckers matured slowly and had scarcely begun to feather up to this date. No record was kept after the ninth day, as we left that locality.

The Northern Pileated Woodpecker feeds by regurgitation as conspicuously as do the Flickers, and for the same reason; namely, that his food is largely ants' eggs and larvæ with which he fills his gullet to pour them out into the throats of the young.

In the case of Kingfishers (*Ceryle alcyon*) nesting in a low sand bank at Riverside, Illinois, we found data valuable and interesting. By care in concealment we were able to discover that the adult came to the nest on the first day with no visible supply of food in the bill but with a gullet conspicuously swollen. We had previously excavated the nest from the rear making a false back to it so that it would be protected from the weather and at the same time open easily. As soon as feeding was completed and the adult out of sight, we opened the nest at the false back, took out the young, then one day old, and examined the crops. They contained a dark gray, oily mass, nearly fluid and very ill smelling, but with no bones or scales in it. If fish they were very small and digested. Returning the young fishers to the tunnel, we closed it. Two days later the experiment was repeated with the same results. Four days later, or the seventh day after hatching, we examined again. This time one of the nestlings had swallowed several small fish about one and one half inches long and the others were still hungry. As yet we had not seen either of the adults bring visible food and the most frequent feedings had been forty minutes apart, I believe all by regurgitation. No record was kept from the seventh to the fourteenth day when an examination was made for the third time. We now found the young showing well developed pin feathers, and there were traces of disgorged fish bones and scales in the nest which had not been

there before. The crops examined showed fish only slightly digested and regurgitative feeding had evidently given place wholly or in part to fresh food. On this day one of the adults brought several fish, possibly four inches long to the nest in different journeys. Examinations made on the twenty-first day revealed the same food conditions as the fourteenth. The pile of fish bones and scales was a trifle larger but was partially buried in the earth. There was surprisingly little of this debris in the nest or tunnel but the ground seemed to be saturated with fishy oil. On the twenty-eighth day the young kingfishers resented being examined or photographed, and made good their escape when taken from the nest.

I am sorry that there is not time to give you records of the Cassin Kingbird, nesting at Pasadena, California, who fed his young by regurgitation for one day; of a Loggerhead Shrike who impaled each grasshopper on a barbed-wire fence, ate the soft parts, and ten minutes later regurgitated them into the throats of his nestlings; of the western Gnatcatchers at San Jose, California, who were fearless in coming to the nest while I bent over it and who gave all meals by regurgitation until feathers were well started over the little ones; of the Sierra Creeper who tucked his nest behind the bark of a dead pine tree and until the nestlings were four days old was never caught carrying visible food to them; of the Audubon Warblers at Lake Tahoe, California; the Yellow Warblers and American Redstart in Illinois, all of whom fed by this method for the first three days.

All of my records of the Lark family have been incomplete and are therefore unreliable.

Among the water birds I have found the Herons, Bitterns and Cormorants feeding by regurgitation in the same violent fashion as the Flickers. There is no record of this method among the game birds, and but few among the birds of prey. The distinction seems to be the condition of the young at hatching. Those species which are covered with down are usually given only fresh food. Although lacking the positive proof of the examination of crops I have reason to believe that the Marsh Hawk is an exception to this rule and regurgitates its food for one day.

Explanatory Note.

At the recent Congress of the A. O. U. in Cambridge the author's attention was called to some parts of the introduction to 'Birds of California,' which have created a wrong impression concerning the work, among those lacking time to investigate the matter. Hence, it seems best to state definitely that *the book* is not the result of one season's reconnaissance in the field; it is based upon the author's own field notes, begun in October, 1894, and continued, with few interruptions, until July, 1902.

These years of data gathering *in the field* were supplemented by two years' work upon the text.

The "test study" refers only to the last five months, which were spent, as stated, in ascertaining so far as possible what birds were *most commonly* met with by the casual observer. The list of places where observations were made includes all places visited during the eight years mentioned, and does not refer alone to the last trip.

Also, the word "cases" on page 13 is used as synonymous with "instances," the specific meaning intended being "broods."

When Mr. F. M. Chapman, in reviewing the book in 'Bird Lore,' interpreted 'cases' as 'species,' the author was appalled and at once wrote to Mr. Chapman, asking that this error be corrected in the next issue. Owing to Mr. Chapman's absence in the Bahamas, the letter failed to reach him and the correction was not made.

TWENTY-SECOND CONGRESS OF THE AMERICAN ORNITHOLOGISTS' UNION.

THE TWENTY-SECOND CONGRESS of the American Ornithologists' Union convened in Cambridge, Mass., Monday evening, November 28, 1904. The business meeting was held in Mr. William Brewster's museum, and the public sessions, commencing Tuesday, November 29, and lasting three days, were held in the Nash Lecture-room of the University Museum.

BUSINESS SESSION.—The meeting was called to order by the President, Mr. Charles B. Cory. Sixteen Fellows were present. The Secretary stated that at the opening of the present Congress

the membership of the Union numbered 808, constituted as follows: Fellows, 46; Honorary Fellows, 18; Corresponding Fellows, 66; Members, 70; Associates, 608.

During the year the Union lost seventy-two members, ten by death, thirty by resignation, and thirty-two for non-payment of dues. The deceased members include one Fellow, two Corresponding Fellows, one Member, and six Associates, as follows: Gurdon Trumbull,¹ a Fellow, who died in Hartford, Conn., Dec. 28, 1903, in his 63d year; Dr. R. A. Philippi, of Chili, a Corresponding Fellow, who died in Aug., 1904; Dr. Samuel W. Woodhouse,² a Corresponding Fellow, who died in Philadelphia, Oct. 23, 1904, in his 84th year; John Fannin,³ a Member, who died at Victoria, British Columbia, June 20, 1904; and the following Associates: Josiah Hoopes,⁴ who died in Westchester, Pa., Jan. 16, 1904, in the 72d year of his age; J. B. Canfield, who died in Bridgeport, Conn., Feb. 18, 1904; James M. Southwick,⁵ who died in Providence, R. I., June 3, 1904, at the age of 58; J. C. Knox,⁶ who was drowned in Shoal Lake, Manitoba, June 10, 1904; Leonard E. Burnett; and Lee Nims.

The report of the Treasurer showed the finances of the Union to be in a satisfactory condition.

All of the officers were reëlected, as follows: Charles B. Cory, President; Charles F. Batchelder and E. W. Nelson, Vice-Presidents; John H. Sage, Secretary; Jonathan Dwight, Jr., Treasurer; Frank M. Chapman, Ruthven Deane, Witmer Stone, A. K. Fisher, Thos. S. Roberts, William Dutcher, and C. W. Richmond, members of the Council.

Glover M. Allen, of Cambridge, Mass.; Robert O. Morris, of Springfield, Mass.; and J. Warren Jacobs, of Waynesburg, Pa., were elected to the class of Members, and the following one hundred and twenty-five persons were elected Associates, namely:

Gerard A. Abbott, Chicago, Ill.; Miss Adeline E. Ackley, East Hamp-

¹ For an obituary notice, see Auk, XXI, pp. 310, 311.

² For an obituary notice, see *Ibid.*, XXII, p. 104.

³ For an obituary notice, see *Ibid.*, XXI, p. 510.

⁴ For an obituary notice, see *Ibid.*, XXI, pp. 311, 312.

⁵ For an obituary notice, see *Ibid.*, XXI, p. 511.

⁶ For an obituary notice, see *Ibid.*, XXII, p. 106.

ton, Conn.; Mrs. Eustace L. Allen, Hartford, Conn.; Edward E. Armstrong, Chicago, Ill.; Frank T. Antis, Canandaigua, N. Y.; A. D. Atwood, Tenaflly, N. J.; Roger N. Baldwin, Wellesley Hills, Mass.; Ernest Harold Baynes, Meriden, N. H.; Wm. A. Birnie, Springfield, Mass.; William S. Bogert, Leonia, N. J.; H. H. Brimley, Raleigh, N. C.; Lewis B. Brown, Toronto, Canada; Miss Elizabeth Brown, Washington, D. C.; Alex. M. Burgess, Providence, R. I.; Miss Charlotte W. Butler, Beverly, Mass.; Louis Cabot, Brookline, Mass.; Rufus H. Carr, Brockton, Mass.; Sidney Chase, Boston, Mass.; A. W. Child, Boston, Mass.; Harold R. Colson, Cambridge, Mass.; Miss Clara L. Crane, Dalton, Mass.; Mrs. Zenas Crane, Dalton, Mass.; James W. Cromwell, New York City; Maunsell S. Crosby, Rhinebeck, N. Y.; Percival de Luce, New York City; S. H. Derickson, Annville, Pa.; Emma E. Drew, Burlington, Vt.; Miss Mary Drummond, Wheaton, Ill.; Dr. Clyde E. Ehinger, Westchester, Pa.; Geo. P. Ells, Norwalk, Conn.; Robert T. Emmet, New Rochelle, N. Y.; John O. Enders, Hartford, Conn.; Paul J. Fair, Freeport, Ill.; John A. Farley, Boston, Mass.; William L. Finley, Portland, Oregon; Henry S. Forbes, Milton, Mass.; Charles H. French, Canton, Mass.; T. Otis Fuller, Needham, Mass.; J. E. Gardner, Cambridge, Mass.; Geo. B. Gates, Madison, S. D.; Langdon Gibson, Schenectady, N. Y.; Arthur F. Gilbert, New Bedford, Mass.; Edward W. Gifford, San Francisco, Calif.; Juliet T. Goodrich, Chicago, Ill.; Miss Amy Goodwin, Cambridge, Mass.; Miss Helen Granger, Cambridge, Mass.; Mrs. Amelia P. Greenough, Boston, Mass.; Miss Marion Gunnison, Ithaca, N. Y.; H. Porter Hall, Leominster, Mass.; Elizabeth S. Hill, Groton, Mass.; Geo. E. Hix, New York City; Herman Horshert, St. Louis, Mo.; John S. Howard, Franklin, Mass.; Rev. V. A. Huard, Quebec, Canada; H. J. Jager, Owatonna, Minn.; John W. Kay, Detroit, Mich.; Wallace G. Kay, Detroit, Mich.; Blanche Kendall, Brookline, Mass.; Francis Kermode, Victoria, B. C.; Chas. R. Keyes, Mt. Vernon, Iowa; A. Vincent Kidder, Cambridge, Mass.; Mrs. Fanny B. Kirkham, Springfield, Mass.; A. B. Klugh, Guelph, Ont.; Mrs. H. R. Kunhardt, New York City; D. Lange, St. Paul, Minn.; Albert L. Lincoln, Brookline, Mass.; John R. Livermore, Katonah, N. Y.; Edward H. Lum, Chatham, N. J.; O. G. Malde, Madison, Wis.; H. W. Marsden, Witch Creek, Calif.; Henry B. McConnell, Cadiz, Ohio; James H. Miller, Lowville, N. Y.; Mrs. E. M. Meade, New York City; Mrs. Geo. R. Mosle, New York City; James A. Munro, Toronto, Ont.; Fred. Mutchler, Worcester, Mass.; Wm. G. Neal, Walton, Ont.; Wm. E. Nichols, New York City; Roy C. Norris, Richmond, Ind.; Mrs. Carrie W. Ormsbee, Brandon, Vt.; A. Osgyani, Bridgeport, Conn.; Miss Isabel M. Paddock, St. Johnsbury, Vt.; Edgar M. Parker, Montgomery City, Mo.; Herbert Parker, So. Lancaster, Mass.; Elmore E. Peake, Salem, Ill.; Clark J. Peck, West Philadelphia, Pa.; Henry O. Peck, Pittsfield, Mass.; James L. Peters, Jamaica Plain, Mass.; Cyrus A. Peterson, St. Louis, Mo.; John C. Phillips, Boston, Mass.; Sherman E. Phillips, Rochester, N. H.; Stanley E. Piper, Washington, D. C.; Grace V. Pomeroy, New York City; Rev. Geo. B.

Pratt, Chicago, Ill.; James N. Proctor, Ventura, Calif.; Chester A. Reed, Worcester, Mass.; Emily E. Reed, Boston, Mass.; Mrs. Wm. Howell Reed, Boston, Mass.; Geo. H. Reynolds, Springfield, Mass.; William Richard, Waterford, N. Y.; Chas. H. Rogers, Wayne, Pa.; G. H. Ross, Rutland, Vt.; Howland Russell, Milwaukee, Wis.; Frank Schwarz, St. Louis, Mo.; Richard P. Stapleton, Holyoke, Mass.; Wm. M. Stillman, Plainfield, N. J.; Chas. R. Stockard, New York City; Chas. S. Strout, Biddeford, Me.; Mrs. F. L. Sturgis, New York City; Myron H. Swenk, Lincoln, Nebr.; Mrs. Thos. W. Thacher, Brookline, Mass.; Dr. M. T. Thompson, Worcester, Mass.; John M. Van Huyck, Lee, Mass.; Arthur W. Van Pelt, Chicago, Ill.; Stephen Visser, Chicago, Ill.; Leo Wallingsford, Alexandria, Ind.; William A. Wheeler, East Templeton, Mass.; Miss Mary E. Winslett, Stevensville, Montana; Wm. R. Wister, Philadelphia, Pa.; Norman A. Wood, Ann Arbor, Mich.; S. T. Wood, Toronto, Ont.; Frank M. Woodruff, Chicago, Ill.; Dr. L. F. Woodward, Worcester, Mass.; Dr. Samuel B. Woodward, Worcester, Mass.; and Carl O. Zerralin, Milton, Mass.

Drs. Allen, Dwight, Merriam and Richmond, and Messrs. Brewster, Ridgway and Stone, were reëlected 'Committee on Classification and Nomenclature of North American Birds.'

PUBLIC SESSION. *First Day.*—The meeting was called to order by Vice-President Batchelder. The papers read during the morning session were as follows:

'The Direction of Flight in the Fall Migration at New Haven,' by Dr. Louis B. Bishop.

'Regurgitative Feeding of Nestlings,' by Mrs. Irene G. Wheelock. Remarks followed by Messrs. Hoffmann and Oldys, Prof. Hodge, Dr. Palmer, and the author.

'Some Interesting 1904 Bird Songs,' by Henry Oldys.

'*Helminthophila leucobronchialis* and *Helminthophila lawrencei*,' by Dr. Louis B. Bishop.

'The Psychological conditions of Bird Study,' by Rev. Wm. R. Lord.

The papers of the afternoon session, illustrated by lantern slides, were:

'Florida Notes,' by Frank M. Chapman.

'The Land Birds of Oregon and California,' by William L. Finley.

Second Day.— The meeting was called to order by the President. The papers read during the morning session were:

‘The Birds of the Southern West Indies,’ by A. H. Clark. Remarks followed by Dr. Palmer.

‘Experiments in rearing Ruffed Grouse in Confinement,’ by Prof. C. F. Hodge. Illustrated by lantern slides, and in the absence of the author presented by Miss Helen A. Ball.

‘Wear in its relation to Subspecies,’ by Dr. Jonathan Dwight, Jr. Remarks followed by Messrs. Nelson, Clark and Dutcher, and the author.

‘A Review of the Gulls which have light-colored Primaries,’ by Dr. Jonathan Dwight, Jr.

‘The Nesting Habits of the Flamingo,’ by Frank M. Chapman. Illustrated by lantern slides.

The following papers — both illustrated by lantern slides — were given at the afternoon session, viz.:

‘The Sea-birds of the Oregon Coast,’ by William L. Finley.

‘Illustrated Readings from Thoreau’s Journals,’ by the Rev. H. W. Gleason.

Third Day.— The meeting was called to order by the President.

The papers of the morning were:

‘The Present Status of the Prairie Chicken east of the Mississippi,’ by Dr. T. S. Palmer.

‘An Untenable Theory of Bird Migration,’ by Prof. W. W. Cooke. Read by Mr. Oberholser in the absence of the author.

‘Observations on the Birds of the Sand-hill Region of Nebraska,’ by Dr. R. H. Wolcott. Illustrated by lantern slides and presented by Dr. Palmer in the author’s absence.

Resolutions were adopted thanking the authorities of Harvard University for the use of the Nash Lecture-room as a place of meeting for the Union; to the Nuttall Ornithological Club for the very cordial welcome and generous hospitality extended to the visiting members and friends of the Union, and to the Harvard Natural History Society for its hospitable invitation.

The following papers were read by title:

‘*Cyanocitta cristata*, and other Eastern Birds, at Wray, Yuma County, Colorado,’ by Horace G. Smith.

'Ornithology of a Churchyard,' by B. S. Bowdish.

As the opening paper of the afternoon, Mr. Dutcher, Chairman of the 'Committee on Protection of North American Birds,' read a summary of the report of his committee for the previous year.

The concluding paper, illustrated by lantern slides, was :

'The Season's Experiences with Shore-birds, Herons and Water-fowl,' by Rev. H. K. Job.

The next meeting of the Union will be held in New York City, in November, 1905.

The good attendance at this Congress, together with the new members elected, the largest number in any year since the founding of the Union, was most gratifying.

JNO. H. SAGE,
Secretary.

GENERAL NOTES.

Sabine's Gull in Montana.—I enclose two photographs of an immature example of Sabine's Gull (*Xema sabini*), which, as far as I know, has not before been recorded from Montana. This bird was shot September 23, on the Yellowstone, by the ferryman at Terry, who told me that on the previous day he had seen about fifty gulls, all resting on the river shore—the flock including this species and others slightly larger. I presumed the larger gulls to be Ring-billed Gulls, which, as well as American Herring Gulls, I have observed on the Yellowstone at different dates.

The specimen is a male. The dimensions in inches are : Length to end of tail, 13; to end of wings, 14; extent, 30; wing, 10; tail, 5; across fork of tail, 1½; bill, along gape, 1½. The bill was black; legs and feet flesh color; irides dark brown.—E. S. CAMERON, *Terry, Montana.*

Additional Record of the European Widgeon (*Marca penelope*).—I have recently examined a fine adult male of this species, which was shot on an overflowed meadow near Nippersink Lake, Lake County, Ill., on April 1, 1904, by Mr. Charles Muehrcke, and is now in his possession. The bird was in company with six of his American cousins, all of whom were shot. The specimen is mounted representing dead game. This record makes the eighteenth for the interior.—RUTHVEN DEANE, *Chicago, Ill.*

Little Blue Heron in Connecticut.—A flock of Little Blue Herons (*Florida carulea*), all young in the white plumage, made its headquarters

during a large part of this summer on a chain of three ponds connected by the Patagansett Stream, township of East Lyme, near this village. Two were recorded on July 22, and until August 18 from one to ten were present on one or another of the ponds every day. After August 18 they disappeared until Sept. 7, when two returned and were then seen for the last time.

I personally observed them from July 25 to July 31 inclusive and on the 28 took one, which upon dissection proved to be a female. The crop was full of small fish, species not determinable by reason of decomposition. This specimen is now in the county collection of Mr. James H. Hill, New London.

The birds were not very wild, and gave me an opportunity to watch them from a short distance. It has been sometimes said that they are silent except on the roost, but I heard them on several occasions, while feeding on the pond margins, utter a low chuckling or croaking sound.—P. J. McCook, *Niantic, Conn.*

Little Blue Heron in Massachusetts.—The Boston Society of Natural History has recently acquired for its New England Collection, a fine specimen of the Little Blue Heron (*Florida cærulea*). It was shot by Mr. Benjamin Pease on Chappaquiddick Island, Edgartown, Martha's Vineyard, on April 14, 1904. The morning when the bird was shot was cold, the ponds were skimmed with ice, and a snow-storm came two hours after the bird's capture. The specimen is unsexed and is in the blue and maroon plumage. I am indebted to Mr. C. W. Johnson, curator of the Society, for permission to record the above facts.—GLOVER M. ALLEN, *Cambridge, Mass.*

Description of Second Michigan Specimen of Cory's Least Bittern.—This bird (*Ardetta neoxena*), taken on the St. Clair Flats May 14, 1904, by Mr. E. Craven of Detroit, Mich., and now in the possession of Mr. J. L. Childs of Floral Park, N. Y., is an adult male in full breeding plumage and shows no very decided departure from what seems to be the typical plumage of the species. A close examination, however, shows both the color aberrations common to this species, and in view of the peculiar interest attached to the variations of individuals of this species, I append the following detailed description of the specimen.

The melanotic tendency is shown only on the head, and is not as erratic in this individual as in many others previously taken, and in the regularity and plan of the black spots resembles specific markings more than aberrant patches. It appears on both sides of the head nearly equally, and a description of one side will do for both, though a close comparison shows that the right side of the head is a little more strongly marked than the left.

The black of the crown shades off softly into the chestnut of the ear coverts, giving that part a peculiarly rich, warm coloring. Below and

behind the eye is a triangular patch of black, its apex following the edge of the bare orbital surface in a thin line to about half way up the eye. The base of the triangle extends backward along the bottom of the ear coverts, fading away at their extremity; and forward, to the angle of the mouth, following the base of the lower mandible in a very fine line until it vanishes in the interramal space beneath.

The albinistic tendency is not as regular in its distribution as the melanotic, and in this respect agrees with the majority of the others that have been taken. On the upper part of the abdominal region, just at the lower edge of the sternum, are two white contour feathers, now springing from opposite sides of the incision made in skinning, but plainly arising from adjoining parts and must have formed a single patch in life. The body down on either side of the taxidermist's cut, and extending for a short distance on either side and from the sternum to the vent is also white.

Each leg is decorated with albino characters. On the left leg there is a patch composed of three feathers showing $\frac{5}{8}$ inch long and extending from the front slightly over half way around the leg and with the lowest point just touching the bare part of the tibia. On the right leg there are but two white feathers placed a little more towards the outer side and extending over a visible space of $\frac{1}{2}$ inch by a little less than half way around and not reaching the bare parts by $\frac{1}{4}$ inch.

All the white is pure and immaculate and not of the creamy coloration seen in corresponding parts of *A. exilis*.—P. A. TAVERNER, *Detroit, Mich.*

Avocet (*Recurvirostra americana*) in New Jersey.—A record of the specimen herewith reported has never been made in any ornithological journal, though the label which it carries is now nearly 25 years old. It was shot at Barnegat, on the ocean beach, and the label, written and enclosed in the glass which protects the bird, bears the legend: "Shot by John Fonda at Barnegat, Decoration Day, 1880." Stone's 'Birds of E. Penn. and New Jersey,' 1894, p. 70, mentions but two records, one in 1877 and one in 1886. This specimen is in Mr. Fonda's possession, nearly as fresh as when mounted, at his home, 250 Gates Avenue, Brooklyn, N. Y.—WILLIAM C. BRAISLIN, M. D., *Brooklyn, N. Y.*

The Turkey Buzzard (*Carthartes aura*) in Maine.—While driving at Scarboro Beach, Me., on August 5, 1904, my attention was directed to a large bird flying over the woods several hundred yards back from the road. I at first took it to be an eagle but at second glance the characteristic sailing of the bird, with tips of wings raised, left no doubt as to its identity. The Buzzard crossed the road behind us, circling over the salt marshes of the Libby River, and finally recrossed the road directly over our carriage and sufficiently near for us to distinctly see the crimson head and neck.

In replying to a letter sent to Mr. Ora W. Knight for other Maine

records, he has very kindly given me the following information under date of August 9, 1904.

"Replying to your inquiry relative to the Turkey Buzzard in Maine, I will say that I have the following unquestionable records: One taken at Standish, Cumberland County, in summer of 1874 (*cf.* Smith, *Forest & Stream*, Vol. XX, p. 26); one taken in Denmark, Oxford County, March, 1882, by Abel Sanborn and now in his possession. (This specimen was recorded by R. A. Gushee in *Forest & Stream*, for 1883, p. 245, and the *same* specimen was erroneously recorded as Black Vulture by Smith, *Forest & Stream*, Vol. XX, p. 285; it has, however, been seen within a year by a number of persons who can vouch that it is a Turkey Vulture, not a Black Vulture). Mr. Boardman had one specimen taken near his home in Calais; one was killed in Buxton in December, 1876 (*cf.* Brown, *Catalogue Birds of Portland*, p. 23).

"All the above records have been carefully verified by inquiry and examination of specimens by undoubted authorities. A few other records have been found to really refer to the Black Vulture or were not susceptible of verification."

Mr. Manly Hardy of Brewer, Me., under date of September 8, 1904, wrote me as follows:—

"Seeing a Turkey Buzzard is a very unusual thing in this State. Some years ago I saw one at Whitney's Hill, near Bangor. It was in a small ash tree in a large open field. It was late in November, after all the Hawks were gone. It was a warm sunny day and he sat with his wings stretched above his head just like the one on the 'Buzzard dollar.' I have seen hundreds of Buzzards but I have never seen any other bird sit in this way. I know of two cases of their having been caught in bear-traps. The hunters did not know what they were but told me of their bare red heads and white bills, so there could be no question of identity."

Mr. G. A. Boardman in his 'Catalogue of the Birds found in the vicinity of Calais, Maine,' etc., published in 1862, records one specimen as referred to by Mr. Knight, but in a copy of this list which he sent me in 1872, with additions and corrections up to date, under Turkey Buzzard he has interlined, "2 since." This last record therefore makes the tenth for the State.—RUTHVEN DEANE, *Chicago, Ill.*

A Correction.—In my list of the birds of Margarita Island, Venezuela (*Auk*, XIX, p. 261), I included *Buteo albicaudatus* Vieill., saying that I obtained one specimen, an immature female. *Buteo albicaudatus* was fairly common near the coast, and the bird I found nailed to a tree near El Valle was of this species; but the specimen brought back proves to be a young female of *Parabuteo unicinctus* (Temm.), the southern form of Harris's Hawk.—AUSTIN H. CLARK, *Boston, Mass.*

The Gray Sea Eagle (*Haliaeetus albicilla*) in British Columbia.—In a small collection of bird-skins bought in the fall of 1903 by Dr. Dwight and

myself from Mr. Fred Foster, a taxidermist in Victoria, British Columbia, we found a single specimen of this species in first winter plumage. On the tag was written only "March 18/98. ♂.", and I wrote Mr. Foster asking him whether he remembered the bird and could tell me where it was taken. He replied. "The Eagle marked March 18/1898 is the young Bald Eagle (or gray eagle); all the eagles were taken on the coast of Vancouver Island."

Thanks to Dr. Dwight, this skin is now in my collection. It is in the same plumage as the young Gray Sea Eagle found dead on Unalaska, Oct. 5, 1899, which I recorded in 'North American Fauna,' No. 19, pp. 73, 74. The range of this species is thus extended almost to Washington, and it seems probable that it will yet be found breeding in Alaska or the Aleutian Islands.—LOUIS B. BISHOP, *New Haven, Conn.*

The Arctic Three-toed Woodpecker in Melrose, Mass.—On October 22, 1904, in Melrose, Middlesex County, Mass., a fine male Arctic Three-toed Woodpecker (*Picoides arcticus*) was seen by Mr. M. C. Blake of Brookline and the subscriber. Subsequently he moved into Pine Banks Park in Malden, but a short distance from where he was first found, and remained there eighteen days, being seen repeatedly by myself and others up to November 8. He worked upon the dead pine trees which unfortunately have been killed in this region by the Gypsy moths.—HORACE W. WRIGHT, *Boston, Mass.*

Wintering of the Red-headed Woodpecker at Detroit, Michigan.—An interesting feature of the extremely severe winter of 1903-1904 was the wintering of the Red-headed Woodpecker (*Melanerpes erythrocephalus*) in large numbers at Belle Isle, the island park of Detroit, situated in the Detroit River slightly above the city. On my many trips there during December, January, and February, on some of the coldest days of the winter, I never failed to find these birds active, energetic, and almost as noisy as in mid-summer. Covered as these woods were with deep snow from December 1, sometimes two or more feet deep, and crusted, it is a matter of interest to me as to what influences this bird to winter here in numbers, and to be entirely absent from the mainland in Wayne, and surrounding counties. I cannot account for the fact that during some winters the Red-heads remain in numbers at Belle Isle, in others are entirely absent. During the winter of 1902-1903 no birds remained; long and frequent search failed to reveal them either here or on the mainland. The abundance of their food supply—acorns for the most part—without doubt determines the wintering of this species, and yet what food could not have been found in as great an abundance and with more ease during the comparatively mild winter of 1902-1903 as during the intense cold and deep snow of 1903-1904? The few birds I have met with on the mainland were single birds residing in a certain tree throughout the winter.—BRADSHAW H. SWALES, *Detroit, Mich.*

The Chuck-will's-widow in Kansas.—I note that on page 17 of Prof. F. H. Snow's Catalogue, 'Birds of Kansas,' he reports the Chuck-will's-widow (*Antrostomus carolinensis*) as an accidental visitor to the State of Kansas. I wish to add a few notes on this interesting species, whereby it can be easily placed as a summer resident in restricted localities along the southern border of the State. My notes were taken during the middle of May, 1902, in the vicinity of Cedarvale, Chautauqua County, located six and one half miles north of the Indian Territory line, in the heart of the Flint Hills.

About 5.00 P. M., May 22, I heard my first Chuck-will's-widow singing in a small copse on Bird Creek, in the Osage Nation, seven miles below the State line. My brother, who was with me at the time, advised me that the Chuck-will's-widows were rather sparingly distributed along the Big Caney Valley, near Cedarvale. He also informed me that previous, in June, 1901, he flushed a parent bird from its young, in a thicket, near town. I believe the statement can be accepted as a substantial fact, as Whip-poor-wills, so he informed me, do not summer there, and during my entire stay of two weeks, none were noted, but Chuck-will's-widows I met with occasionally in the thickets along the Caney River, in the State.

About dusk, on the evening of May 24, and for several ensuing evenings, I heard three or four Chuck-will's-widows singing in the thickets near the town of Cedarvale, Kansas.

The fact that the specimen that Prof. Snow speaks of, was secured in the middle of June, is, in my opinion, a warrant to believe it other than an accidental specimen.—W. S. COLVIN, *Osawatomie, Kans.*

The Raven in Southern New Hampshire: A Comment.—Apropos of my Monadnock Raven-record, published in 'The Auk,' for October, 1904 (p. 491), Mr. John E. Thayer writes me that a yearling Raven escaped from his aviary at Lancaster, Mass., less than forty miles southeast of Monadnock, on May 28, 1903, and disappeared after loitering about Lancaster for almost a week. Probably, as Mr. Thayer suggests, it was this bird that appeared on Monadnock on July 4. At all events, the likelihood that such was the case robs my record of all value.—GERALD H. THAYER, *Monadnock, N. H.*

The Blue Jay and other Eastern Birds at Wray, Yuma County, Colorado.—During a few days' collecting (May 17–22, 1904) at Wray, Yuma Co., Colo., in company with Mr. Wm. C. Ferril, curator of the Colorado State Historical and Natural History Society, a number of Eastern species whose Colorado range is little known, were secured for the State museum.

Most notable of these was a female Blue Jay (*Cyanocitta cristata*)—shot by the writer May 21 near a corral about a mile from town—which I believe is the first one taken in the State. However, to Mr. W. E.

Wolfe of Wray, an Associate of the American Ornithologists' Union, belongs the credit of first reporting to the writer the occurrence of the species within our borders, he having observed several during the two previous years, and indeed it was partly for the purpose of securing a specimen that the above trip was undertaken. Through the guidance of Mr. Wolfe we were not long in locating three specimens within the town, and soon discovered a nest in process of construction in the crotch of a cottonwood tree on one of the main streets. An attempt was made to shoot one of these, but as they were rather wild it was abandoned as unsafe and the next day — May 21 — we tried the country in the vicinity of Jackson Cañon, with the result above mentioned. Several others were seen within the Cañon but on being approached took flight and left the locality during our stay there.

Mr. Wolfe informed me that he had previously found the species breeding just over the State line in Nebraska. According to his observations they do not spend the winter at Wray.

Coccyzus erythrophthalmus. BLACK-BILLED CUCKOO.— A single male was taken in Jackson Cañon May 21, thus adding one more to the meagre records for the species in the State. Mr. Wolfe believes he has observed it in the locality before.

Guiraca caerulea lazula. WESTERN BLUE GROSBEAK.— Another northern capture, a male at Jackson Cañon May 21. At least one other was seen in the same locality later in the day. Mr. Wolfe occasionally meets with it, he tells me.

Vireo bellii. BELL VIREO.— To the single male specimen taken by the writer near Denver, June 12, 1903, and recorded in 'The Auk,' I can now add three more — two taken by myself on May 18 and 20 respectively, and one taken by Curator Ferril on May 21. Two of these proved to be males, the third was undetermined. All were taken in the vicinity of Wray, and several others were heard, both in Jackson Cañon and at Olive Creek.

Helminthophila peregrina. TENNESSEE WARBLER.— Shot two females in the shrubbery of Jackson Cañon, May 20 and 21 respectively.— HORACE G. SMITH, *Ass't. Curator, State Historical and Natural History Society, Denver, Colorado*.

The Blue Jay at Yuma, Colorado.— Miss Jennie M. Patten, of Yuma, Colo., writes that she saw a Blue Jay (*Cyanocitta cristata*) at Yuma, on November 1, 1904, under such circumstances that there can be no possible mistake as to its identity. She also reports that last year two were seen in Yuma. I find no record of the species in Colorado, but Mr. Horace G. Smith, of Denver, informs me that he took one at Wray, Colo., on May 21, 1904, of which he has recently sent a record for publication in 'The Auk'. For the purpose of centralizing the records it might be well to have this record in the same issue.— JUNIUS HENDERSON, *Boulder, Colo.*

Another Deformed Bill.—On page 279 of the April number of 'The Auk', 1904, is figured and described an abnormal bill of *Corvus americanus*. This brought to mind a bill deformity in the English Sparrow in my collection, of which I herewith append a description:—

Passer domesticus, ♂, Snyder Collection, No. 5399, San Jose, Calif., Jan. 3, 1900, coll. by Ernest Adams. Plumage and lower mandible normal; both mandibles of usual color. Upper mandible: Length, 18.5 mm., width, 6 mm.; depth 4 mm.; notched on both sides, the notch being back 4.5 mm. from tip. Tip of mandible broken off abruptly. Mandible from base to tip of equal depth and width throughout.—W. E. SNYDER, *Beaver Dam, Wis.*

Clay-colored Sparrow in the Cariboo District, British Columbia.—On the 3d July, 1901, at 158-Mile House, Cariboo District, I shot two sparrows which I identified at the time as *Spizella breweri*. I now find these to be Clay-colored Sparrows, *Spizella pallida*,—another instance of the infusion of the Great Plains element so noticeable in that District.

These were both singing males but they were not breeding though the sexual organs were greatly enlarged. I had worked the locality where they were taken very thoroughly for about two months previously without hearing their very peculiar song, which as soon as heard at once drew my attention.—ALLAN BROOKS, *Comox, B. C.*

Henslow's Sparrow in St. Clair County, Michigan.—Up to the present season Henslow's Sparrow (*Ammodramus henslowii*) has been treated by me as a rare summer resident in southeastern Michigan. The only authentic record of the occurrence of the species here was made by Mr. Jas. B. Purdy of Plymouth, Wayne County, who detected a pair breeding in a hay field near his home on July 27, 1893, and discovered the nest in the tall grass, containing eggs which were destroyed by the mowing machine. Mr. Purdy secured the female. (Auk, 1897, p. 220).

On the Canadian side of Lake St. Clair, near the mouth of the Thames River, Mr. W. E. Saunders found a small colony of about ten pairs on May 24, and June 12, 1898. On July 2 he met with two males near Sarnia, Ontario, which is directly across from Port Huron. (Bull. Mich. Ornith. Club, Vol. II, p. 38.)

The above records sum up all available data with regard to this species here.

Lake St. Clair, in southern St. Clair County, is bordered by an extensive stretch of grassy meadows which practically extend the entire circuit of the lake. This territory is flat, very wet in places, and is intersected with an occasional slough or dredged cut bordered by a growth of willows. In this section of the country I was convinced that Henslow's Sparrow would be found, if anywhere, especially with the Ontario records on the Canadian side.

On June 18, 1904, Mr. Percy A. Taverner and I were working in the

locality and were passing down the line of willows along an extensive canal. A strange faint note arising from out of the meadows beyond arrested our attention, the author of which we could not discover. It struck me that this was the object of our search although I had never met with the species before. This supposition proved correct, as a few minutes later Taverner was able to flush a small bird, which he secured, proving it to be a female Henslow's Sparrow. We found a small colony of these birds in this portion of the meadows—about twelve pairs as far as we could judge. The two females taken demonstrated that they were breeding by the bare abdomen and the tough thickened skin of the belly. In the limited amount of time at our disposal no nests were found; indeed, it was a difficult matter to locate the birds themselves, much less the nests. In the vast expanse of meadow the search was in vain. By careful concentration we could detect the *se-slick* notes of the birds arising from out of the medley caused by the Meadowlark, Bobolink, and Red-winged Blackbird, but to an unaccustomed ear the notes would easily be passed over or ignored.

The birds favored perching on the tops of the various weed stalks, golden-rod, asters, etc., that invested certain portions of the field. Once flushed the birds would fly in a peculiar wavering manner a short distance, drop suddenly into the tangled grass, and were with extreme difficulty put up again. Mouse-like they would worm their way through the matted grass and were shortly in a different direction from the place one expected to find them. Towards sunset the birds were more active and the notes would arise from various points. I did not hear them after sunset.

We visited this colony again on July 23 and 24 and August 21. On the latter date the birds had moved up to higher ground where a tangle of golden-rod and other weeds made a good cover. On September 25 thorough search failed to reveal even a single bird. On October 2, in Wayne County, we were passing through a neglected piece of meadow when I flushed a small sparrow which, by its peculiar flight I realized was an *Ammodramus* of some species. This bird quickly dropped into the grass and we searched for an hour before Taverner flushed it again in a distant portion of the field and secured it. This bird proved to be a male Henslow's Sparrow—a much more brightly plumed bird than the June specimens; the dark streaks of the sides showed up very plainly against the ochreous wash on the breast.

I think that *A. henslowii* will prove to be a much more abundant species in this section of Michigan than is supposed, though very locally distributed.—BRADSHAW H. SWALES, *Detroit, Mich.*

The Northern Parula Warbler in Southern Michigan.—I am enabled by the courtesy of Mr. J. Claire Wood of Detroit to record the first specimen of the Northern Parula Warbler (*Compsothlypis americana usneæ*) taken in Wayne County, Michigan. On September 25, 1904, Mr. Wood

met with several of these birds and secured an adult male which is now in his collection. I have expected to find this species here for some time, as Mr. Taverner found it at Port Huron, St. Clair County, to the north, and it has been taken in Monroe and Washenaw Counties, southeast of here. — BRADSHAW H. SWALES, *Detroit, Mich.*

Bachman's Warbler in Leon County, Florida. — In the October, 1904, number of 'The Auk' Mr. R. W. Williams, Jr., in a list of the birds of Leon County, Florida, says concerning Bachman's Warbler: "Only one record. I took this specimen on August 4, 1900." On March 22, 1904, while in company with Mr. Morgan Hebard of Thomasville, Georgia, I collected a male specimen of this species in a black gum swamp in the extreme northeastern section of Leon County, about four miles distant from the Georgia line. The individual taken was in company with several others which appeared to be the same species, but as the identity was not known until the specimen was in hand, no others were secured. — JAMES A. G. REHN, *Acad. Nat. Sciences, Philadelphia, Pa.*

The First Hooded Warbler Taken in Maine. — On the 9th of September, 1904, Mr. Samuel T. Dana, of Portland, informed me that he had seen a Hooded Warbler (*Wilsonia mitrata*) at Falmouth. As this bird had never, to my knowledge, been recorded in Maine, I asked him to secure a specimen, which he did on the 10th of September, 1904. The bird was brought to a Portland taxidermist the same day and mounted. It is now in the possession of Mr. Dana. It is a male bird, an adult, and is in perfect plumage. It was taken in the trees near a dwelling, and had been there several days, in company with other warblers. The capture of this warbler and the establishing of a new record has attracted considerable comment among local ornithologists. — W. H. BROWNSON, *Portland, Maine.*

Breeding of the Hudsonian Chickadee (*Parus hudsonicus*) at Dover, Me. — There has been so little said or written in relation to the breeding of this species that the record of a nest with young discovered by the writer the present season may be of some value to the working ornithologists.

During a 12 years' residence at Dover, Piscataquis County, I have occasionally during my rambles met this species, but the meetings have usually occurred during the late fall or winter seasons, and have been so infrequent as to merit a special record in my notes. Accordingly it was indeed a surprise to discover a pair engaged in the act of rearing a brood of young this season. The date was June 21. I had spent the morning botanizing in a place locally known as Sangerville bog, located due west from Dover village, the nearest portion of the bog being about a mile distant. The boundary line between the towns of Dover and Sangerville passes directly through the morass, a portion lying in either town, but the 'find' was located on the Dover side.

This bog is of the character of many others scattered throughout northern and central Maine, lying in a valley surrounded by hills of moderate height, the slopes of which are well wooded, principally with beech, birch and poplar. The swampy margin of the bog produces a belt of fir and cedar with a fair percentage of yellow birch and swamp maple, while the center of the bog consists of open areas interspersed with clumps of the hackmatack, locally known as juniper.

The nest was located in the coniferous belt at the extreme edge of the swamp, about six rods from an opening where the growth had been cut away and is now occupied as pasture. A portion of a dead cedar, nine inches in diameter and about ten feet in length, had fallen and stood leaning with a gentle incline against a birch, and in this stub about four feet from the ground the nest was located. The birds had done apparently but little excavating in solid wood; taking advantage of a decayed place in the side of the stub, had there begun their building operations. The opening at the entrance was irregular in shape, measuring about two by three inches, the cavity expanding with the descent until a depth of six inches was reached where the inside diameter was about four inches, and there the nest was placed. It contained six young birds, well covered with dark feathers, which were probably about a week out of the shell, and they filled the nest so completely it was a question how they would all be able to exist and reach maturity in these narrow quarters.

The old birds were engaged in feeding the young, and the fact of one having a woodland moth — species unknown — in its bill first led me to suspect a brood of nestlings might be near. Both birds were seen and positively identified through my glass at a distance of about 30 feet before the nest was discovered. While I was examining the nest, the bird with the moth in its bill, presumably the female, as she was the most fearless of the pair, flew to within seven or eight feet of my head and nearly on a level with it, showing the greatest anxiety and uttering piteous cries. Her call notes before I approached the nest were similar to the following syllables, *tswee-chee ya-a-a-ck* (emphasis on last syllable and with rising inflection) and were uttered at intervals of five or six seconds quite constantly. The male was not apparently as anxious as his mate, nor did I hear any note from him during my stay in the vicinity of near a half hour.

I could not remain longer to study this interesting family, and after carefully marking the spot, returned home intending to return and secure material proof of the bird's identity, but business detained me and I was not able to again visit the place until July 1, an absence of ten days, when I found the nest empty. From its appearance I had no doubt that the young brood had occupied it until within a day or so, and expected to find them near, but a search of the surrounding territory failed to discover any trace of them.

The stub containing the nest was secured and the nest-lining examined, which proved to consist mainly of vegetable down from ferns and what

appeared to be the fur of the northern hare or rabbit nicely felted together.

This record of *Parus hudsonicus* would appear to indicate a later season for nesting than that occupied by *P. atricapillus*, as I discovered a flock of the latter containing both the old and young birds, several days from the nest, feeding only a few rods from the spot where, snug in their tree, lay concealed the brood of young *hudsonicus* which appeared to be only about a week out of the shell. Accordingly *atricapillus* must have been out in the world quite ten days before *hudsonicus* would leave its nest.

During my rambles in this vicinity in the months of September and October, I found *hudsonicus* to be more abundant than during previous years, and on at least one occasion a flock containing five or six individuals was seen. May we not hope that this occasional resident bird is becoming more abundant within our borders, and that the observations of future seasons may prove it to be a permanent though rare species.—
SANFORD RITCHIE, *Dover, Me.*

Hudsonian Chickadee about Boston, Mass.—Mr. M. C. Blake and I have four records of the Hudsonian Chickadee (*Parus hudsonicus*) in the vicinity of Boston in November, 1904, namely: Middlesex Fells, Virginia Wood, November 4; Ipswich, Castle Hill, November 12; Belmont, November 25; and Waverley, Beaver Brook Reservation, November 25. In each instance a single Hudsonian has been in the company of a flock of Blackcaps in evergreen growth. In the case of the Ipswich bird he was in closely growing young spruces and hardly above the level of the eye and was very finely seen while he gave a sweet warbling song. The Belmont bird was also well seen and gave a few notes of the warbling song. In another flock of *P. atricapillus* the distinctive calls of a second *hudsonicus* were heard, and when we reached Waverley upon the same afternoon a third *hudsonicus* was giving calls among a flock of *atricapillus*. As it has not been my good fortune in previous autumns and winters to meet with this species, it would appear that at least it is in more evidence this season in the vicinity of Boston than for the last five years.—
HORACE W. WRIGHT, *Boston, Mass.*

• **The Blue-gray Gnatcatcher in the Public Garden, Boston, Mass.**—In the early morning of October 22, 1904, which was clear with a light southwesterly wind, following a southeasterly gale of fifty miles an hour along the Middle Atlantic and New England coasts the previous day, I found upon entering our Public Garden in the heart of the city a Blue-gray Gnatcatcher (*Polioptila cærulea*). Immediately upon my entrance his call was heard from a neighboring beech, and being different from any call-note with which I was acquainted,—tiny, nervously given and oft-repeated,—it guided me at once to the presence of the bird. He constantly flitted from one bough to another with even more rapidity than does a kinglet and was of about kinglet size. The clear blue-gray of the entire head

and back, the white outer tail-feathers, the drooping of the wings and erectness of the tail at once made his identity clear. He was also engaged in his flittings in catching and eating insects. His companions were Black-poll Warblers and Juncos. From the beech he took flight into a tall sycamore maple and gradually worked down from the top of the tree into the lower branches, where he was seen at very near range and his catching of insects was observed with much interest. The House Sparrows, however, soon began to make trouble for him and at length drove him to a distance, but not before I had spent twenty minutes with this so rare bird in Massachusetts and made good acquaintance with it. I had not observed whether it had a black forehead and black line over the eye, not knowing at the time that these markings differentiate the male from the female, but as the color of the entire upper parts was a conspicuously clear *blue-gray*, and Coues's 'Key' describes the female as "duller and more grayish above," it was not improbably a male. When I made my usual morning visit to the Public Garden the next day, the Gnatcatcher could not be found. In the 'Birds of Massachusetts,' compiled by Messrs. R. H. Howe, Jr., and G. M. Allen, and issued in 1901, but six records of *Polioptila cærulea* are given, namely: *Chatham*, November 18, 1877; *Falmouth*, December 18, 1877; *Magnolia*, August 27, 1879; *Osterville*, September 26, 1879; *Brookline*, September 8, 1887; *Highland Light*, October 9, 1889. In the opinion of Mr. Willam Brewster it is not improbable that the bird may have drifted north before the southerly storm of October 21. — HORACE W. WRIGHT, *Boston, Mass.*

Notes on Several Rare Southeastern Michigan Birds. — *Gavia lumme*. RED-THROATED LOON.— We recently examined an immature bird of this species in the flesh which was shot November 11, 1904, on the Detroit River, near Point Mouille, by a local gunner and sent in to L. J. Eppinger, the local taxidermist, for mounting. This is the first record for *Gavia lumme* in southeastern Michigan, and there are but two records for the southern peninsula, both very old.

***Oidemia deglandi*. WHITE-WINGED SCOTER.**— A bird of this species, sex not determined, was shot November 11, 1904, on the Detroit River, off Point Mouille, and sent in for mounting to Mr. Eppinger. No prior record for Wayne County is obtainable, although Mr. Swales examined a mounted specimen taken at the North Channel, St. Clair Flats, by Henry Avery during the fall of 1900.

***Oidemia perspicillata*. SURF SCOTER.**— A female Surf Scoter was shot at the St. Clair Flats, St. Clair County, on October 13, 1904, and sent in with other ducks to Mr. Eppinger's, where we examined it. This is the second record for the species in this section, but without doubt both this and *O. deglandi* are occasionally shot by the gunners without the birds falling into any ornithologist's hands.

***Cistothorus stellaris*. SHORT-BILLED MARSH WREN.**— On October 2, 1904, Mr. Swales shot a female in Wayne County, six miles north of De-

troit, in a tangled grassy field. In fifteen years' observation, this is the first *stellaris* that has actually been taken here. Mr. Jas. B. Purdy writes that some years ago he met with a pair of this species near Plymouth, where he found it breeding.—B. H. SWALES AND P. A. TAVERNER, *Detroit, Mich.*

Additional Records for Southeastern Michigan.—SAVANNA SPARROW. *Passerculus sandwichensis savanna*.—June 18, 1904, near Pearl Beach, St. Clair Co., on the edge of the St. Clair Flats, I found a colony of these birds breeding. About a dozen birds were seen.

CLAY-COLORED SPARROW. *Spizella pallida*.—Took one bird at Port Huron, St. Clair Co., May 2, 1901. The specimen is in the collection of J. H. Fleming of Toronto, Ont.

LINCOLN'S SPARROW. *Melospiza lincolni*.—May 15, 1904, I took a male near Palmer Park, Detroit. It is in the collection of B. H. Swales.

PRAIRIE WARBLER. *Dendroica discolor*.—I took a female at Port Huron, May 20, 1900. It is now in the collection of J. H. Fleming.

CONNECTICUT WARBLER. *Geothlypis agilis*.—May 23, 1900, a female, taken at Port Huron. Now in collection of J. H. Fleming.

I also wish to record a Purple Gallinule (*Ionornis martinica*) taken near Guelph, Wellington Co., Ontario, about 1894. It is an immature bird and is in the possession of Mr. Wm. Holliday of that city.—P. A. TAVERNER, *Detroit, Mich.*

The Apparent Power of Reasoning in Birds.—The *apparent* power of reasoning, I say, because we cannot be sure of an animal's mental condition, as Mr. Wheeler points out in 'The Auk' for April, 1904, our mind being no doubt very different from that of the animal. We will have to be converted into the animal and live for a while as such before we can thoroughly understand how it feels and what motive causes it to act in a certain way. It does not do for us to treat the animal's actions as though it were a human being, and yet there are actions on the part of the animal which seem to show some mental faculty closely akin to man's power of reasoning. Whether the animal really has any forethought as to the best method of accomplishing a desired end or not we cannot say, but at times it certainly appears to have.

In the early summer of 1903, a friend and myself procured a nest of young Red-winged Blackbirds and raised the brood. Since then I have made a pet of one of them—a female. The cage sits upon the window-sill and the blackbird takes much interest in the English Sparrows which are attracted to the outer sill by her presence. Her cage has a large perch which reaches the full length of the window. This perch is securely fastened at one end while the other end rests in a notch upon a cross strip of wood. This perch is some twelve inches from the windowpane, and when upon it the blackbird was unable to see the sparrows upon the outer sill. In some way or other she discovered that one end of the perch was free.

She would cling to the side of the cage and pry under this end with her bill until she had raised the perch up out of the notch where it rested, then, by a series of pushes with her bill, or by having one foot upon the perch and the other upon the side of the cage, she would work it over until it reached diagonally to the corner of the cage. She could now stand upon it and look out at the sparrows. Of course she may have discovered this by accident, but she went about it in such a methodical way that she appeared to be thoroughly aware that in this way she could accomplish her end.

She also displayed another bit of intelligence — if I may call it such. I had caged a male Cardinal with her. There was no assertion of authority on the Cardinal's part — he gave in to her in everything. But with the Cardinal came a new kind of food into the cage. I fed him a mixed seed, a good portion of which was sunflower seeds. Now the blackbird's bill was not strong enough to break the sunflower seed. She watched the Cardinal eat them, and she finally took the following method of procuring them :

The Cardinal would pick up a sunflower seed and start to crack it in his bill. When he had cracked it several times, the blackbird would walk up to him and seize it and she was then able to get at the contents with little trouble.

In obtaining these ends the blackbird seemed to show some instinctive or mental faculty which, if not identical, is apparently very similar to the reasoning powers of man.— CHRESWELL J. HUNT, 1306 N. 53rd St., Philadelphia, Pa.

Guthrie's Geography, 1815 Edition.— Some of the readers of 'The Auk' may be interested to know that a copy of the second volume of the 1815 edition of Guthrie's 'Geography' has recently come to light. This edition had become so rare that in 1894 Mr. S. N. Rhoads issued a reprint of the zoölogical matter contained therein,¹ and which, as was shown by Mr. Rhoads, was prepared by Mr. George Ord expressly for this edition.

The copy above referred to was found amongst a street-corner lot of old books, composed for the most part of school books and modern editions of travel, fiction, etc., and is in fairly good condition, seemingly complete as to text and maps. Since Mr. Rhoads's reprint appeared, the copy therein referred to as having been lost¹ from the library of the Philadelphia Academy of Natural Sciences has come to light and proves to be a "separate" only of the zoölogical portion of Volume II. The copy now noticed would appear to be the second known copy of this edition, which is the only edition of the work containing the technical portion of the Zoölogy.— C. J. PENNOCK, 8 Kennett Square, Pa.

¹ See 'The Auk' for January, 1895, and April, 1896.

Audubon's Ornithological Biography.—Reading in the April, 1904, number of 'The Auk' the note by Mr. Reginald Heber Howe, Jr. on a certain imprint of this work reminds me that I have a copy with similar imprint in my ornithological library. My copy has untrimmed margins, is yellow with age and bound in cardboard covered with a thin, unmarked, uncolored cloth. This copy contains 528 pages, 506 being of text, followed by an Index, Prospectus, Contents of Vol. I of the Birds of America, Extracts from Reviews, and List of Subscribers. My copy was received in 1894 from Wm. D. Doan of Coatsville, Pa.—W. E. SNYDER, *Beaver Dam, Wisc.*

RECENT LITERATURE.

Cooke's Distribution and Migration of North American Warblers.¹—It is with great pleasure that we welcome Professor Cooke's important contribution to our knowledge of the seasonal distribution and migration of this, one of the largest and the most distinctly peculiar of North American birds, the Warblers, or the Mniotiltidæ. It is a subject which has long occupied the author's attention, and for the investigation of which he has had access to an accumulation of data gathered during many years of well directed effort on the part of the Chief of the Biological Survey, Dr. C. Hart Merriam—an amount of information unequalled outside of North America for the investigation of the distribution and migration of the birds of any area or of any group. The degree of migration exhibited by different members of the family varies, as is well known, from nearly sedentary species to those which breed as far north as the limit of arboreal vegetation and spend the winter far down in the tropics. Some, also, are exceedingly local in their dispersal, while others range over a large part of two continents.

Professor Cooke treats first and rather briefly (pp. 8–14) of migration routes, on the same lines as in his paper in the present number of 'The Auk' (pp. 1–15) entitled 'Routes of Bird Migration,' and also in his 'Some New Facts about Bird Migration' (see Auk, XXI, p. 501), but of course with more direct reference to his present subject. The species are first (pp. 14–16) briefly reviewed with reference to the "southernmost extension of their winter ranges," those of eastern North America being

¹ Distribution and Migration of North American Warblers. By Wells W. Cooke, Assistant, Biological Survey, U. S. Department of Agriculture, Division of Biological Survey—Bulletin No. 18, C. Hart Merriam, Chief. Washington: Government Printing Office, 1904. 8vo, pp. 142.

arranged under four categories : (1) 'Species that range to the mainland of South America'—about 20; (2) 'Species known to range to but not beyond Panama,'—7 species; (3) 'Species entering Mexico and Central America but not known to reach Panama'—9 species; (4) 'Species that do not regularly winter on the mainland south of the United States, but remain in the Southern States or the West Indies'—11 species.

The species formally treated in the 'Systematic' part (pp. 16-139) include only those found north of Mexico and in Lower California, and are taken up in the sequence of the A. O. U. Check-List; they number "59 species and 19 subspecies." "In each case," says the author, "the breeding range is given first, then the winter range, followed by a synopsis of the time of spring migration and of fall migration.... Most interest attaches to the movements of the warblers of the eastern part of the United States that pass by flight over water to their winter homes. These, therefore, receive full treatment, while less is said of the migration of the western species that make the journey from the United States to Mexico and southward entirely by land. Special attention has been paid to the definition of the southern limit of the breeding range of each species—a subject that for many years has received the careful consideration of the Biological Survey. So far as known to the writer," continues the author, "the present paper is the first attempt to define exactly the northern limit of the winter range of each species, and also to indicate the altitudinal range of the same in its winter home."

The above extract fully sets forth the scope and aims of the work, which appear to have been carried out with all possible care and completeness; and we have thus a contribution to ornithological literature as unique as it is important. Based largely on records received from voluntary observers by the Biological Survey, from land stations and lighthouses covering a wide area and a period of twenty years or more, other unpublished records from Mexico, Nicaragua, and especially Costa Rica, have also been available, and the literature of ornithology has been systematically examined, and thousands of scattered records have been collated and utilized. While there are still gaps to be filled, as along the Gulf coast of the United States, and in Middle America between Mexico and Costa Rica, we have at least the main facts conveniently accessible, for which we should be deeply grateful.—J. A. A.

Osgood on Birds of Alaska.—In his account of 'A Biological Reconnaissance of the Base of the Alaska Peninsula,'¹ made during the summer and fall of 1902, Mr. Osgood gives a general account of the country traversed, with lists of the mammals and birds (pp. 51-81) collected or observed by him, or hitherto recorded or collected by others. He landed

¹ North American Fauna, No. 24, November 23, 1904, pp. 1-86, with 2 maps and 5 half-tone plates.

at Iliamna Bay July 10, and proceeded westward and northward to Lake Clark, then westward and southward to Nushagak, on Bristol Bay, and then eastward again across the peninsula to Cold Bay, near the mouth of Shelikof Strait. A map of the region traversed indicates the principal physical features, and another map the faunistic features, while eleven half-tone cuts furnish views of scenery and vegetation in a hitherto almost unexplored region. About twelve pages are given to a general description of the region, and four to a consideration of its life zones, which are plotted on the accompanying map. The journey was made chiefly by canoe. The special interest of the region consists in the fact that it constitutes the meeting ground of the Hudsonian and Arctic life zones, the boundary between which, being the junction of the treeless and timbered regions, Mr. Osgood is now able to define with considerable accuracy. "The Arctic occupies the main part of the Alaska Peninsula southwest of the vicinity of Naknek Lake, together with a narrow strip northward along the coast of Bristol Bay and Bering Sea; the Hudsonian stretches over the region to the northward on the mainland."

The annotated 'List of Birds' numbers 134 species, based in part on specimens taken by the late C. L. McKay, and his successor J. W. Johnson, some twenty years ago (1881-1886) when stationed as United States Signal Service observers at Nushagak (formerly Fort Alexander), and not hitherto published, except to some extent incidentally. With the exception of the work of McKay and Johnson, nothing had been done in this region before Mr. Osgood's visit in 1902. It is fortunate to have their records, resting on specimens in the National Museum, thus rescued and brought together with those of Mr. Osgood. The McKay-Johnson specimens here mentioned appear to represent about 111 species, while Osgood appears to have taken or positively identified about 108, respecting many of which he has extended and very interesting field notes. — J. A. A.

Nelson on New Birds from Mexico.—Mr. Nelson has recently described¹ four new birds collected by Mr. E. A. Goldman during the spring and summer of 1904 in southern Mexico, mostly in the state of Chiapas. They are: (1) *Porzana goldmani*, generally similar to *P. noveboracensis*, from the Valley of Toluca, Mexico; (2) *Empidonax fulvifrons fusciceps*, from Chiapas; (3) *Arremonops superciliosus chiapensis*; (4) *Telmatodytes palustris toluensis*, from Valley of Toluca. — J. A. A.

Henderson's Additional List of Boulder County, Colorado, Birds.² —

¹ Descriptions of Four New Birds from Mexico. By E. W. Nelson. Proc. Biol. Soc. Wash., XVII, pp. 151, 152, Oct. 6, 1904.

² Additional List of Boulder County Birds, with Comments thereon. By Junius Henderson. The University of Colorado Studies, Vol. II, No. 2, July, 1904, pp. 107-112.

This is an addition of about 50 species to a previous "preliminary list"¹ (which we have not seen), published in April, 1903, which makes "a total of 206 species now recorded from the County." The nominal list of additions is followed by several pages of interesting annotations, those on the Juncos (of which six species are listed) and the White-necked Raven being of special interest.—J. A. A.

Preliminary Review of the Birds of Nebraska.² — This 'preliminary review' is under the joint authorship of Messrs. Lawrence Bruner, Robert H. Walcott, and Myron H. Swenk. An introduction of two pages states the origin, purpose, and scope of the work, and the share each author had in its preparation. It also states that, preliminary as it is in the sense of being the forerunner, it is hoped, of a more elaborate work to appear later, "it has been prepared with the greatest care, and is believed to represent exactly the state of our knowledge at the present day." The introduction is followed by an essay by Professor Bruner on 'Birds in their Relation to Agriculture and Horticulture' (pp. 5-11), in which it is stated that 400 different kinds of birds have been found within the State of Nebraska, of which 200 are known to nest within the State. The 'Synopsis and List,' forming the main text (pp. 15-116), is preceded by two pages of cuts and explanations illustrating the 'Topography of Bohemian Waxwing for Beginners,' which, with the 'synopses,' is designed to make the work useful to those who are not ornithologists, and so aid in increasing interest in birds "and advancing the cause of bird protection." The 'synopses' are in the nature of 'keys,' to the higher groups as well as to the species and subspecies, and are based (with acknowledgments) on those in Apgar's 'Birds of the Eastern United States.' As the keys are printed in the same style and size of type as the list, the different kinds of matter are not obvious except on actual inspection of the text. The numeration, as well as the nomenclature, is that of the A. O. U. Check-List, but a special or consecutive numeration could have been added (in parenthesis after the A. O. U. No.) with advantage, especially in the absence of any general summary of the list. Species previously attributed to the State on what is now considered unsatisfactory evidence, as well as those of probable occurrence but not yet detected, are included, both in the keys and in the list, but in the list are properly distinguished from the authenticated species,—the first by being placed between brackets, and the latter by the designation 'extra-limital.' The list is thus apparently all the authors claim for it—a careful exposition of

¹ *Ibid.*, Vol. I, No. 3, April, 1903.

² A | Preliminary Review | of the | Birds of Nebraska | with Synopses | — |
By | Lawrence Bruner, Robert H. Walcott, Myron H. Swenk — (No date nor
publisher's imprint on title page.) Klopp & Bartlett Co., Omaha, Neb. 8vo.
pp. 1-116, and an unpagel index of 5 leaves.

present knowledge of the birds of Nebraska, and as such, with its included 'synopses,' must prove of great assistance to students of Nebraska ornithology, as well as an important contribution to faunal literature. —J. A. A.

Scott on the Inheritance of Song in Passerine Birds. — In two recent papers in 'Science'¹ Mr. Scott continues the relation of his interesting observations in regard to the growth, changes of plumage, song, and nest-building of hand-reared Rose-breasted Grosbeaks and Meadowlarks. On June 19, 1903, three young Grosbeaks, then about five days old, were taken from the nest and successfully reared by hand in the author's aviary, and were thus excluded from contact with wild birds of their own species. They had moulted by September into the usual fall dress of the species, and the second moult was completed early in February, this including the tail feathers but not the wing quills, which latter, however, underwent some change in color. Just what the change was is not stated, but as to the 'how' of the change Mr. Scott tells us, in italic type, "I am strongly inclined to the opinion that there is a physical change in the feather itself, which alters its appearance so far as color is concerned"; or, as he says again, the primaries "attain their brilliancy either by wear or *by direct change in the color of the feather.*" As this is given as his "opinion," we naturally wait with interest for some *proof* that this opinion has some basis of fact, since the well-established facts thus far are quite opposed to such a belief.

Soon after the Grosbeaks, of which two were males and the other a female, had recovered from their second moult the males began to make feeble attempts at song, which presently increased in volume, and while extremely musical and possessing "the soft plaintive quality characteristic of the Rose-breasted Grosbeak," "no one would refer the *method* of song to the bird in question." In the second report on these birds, and referring to the third week in May, 1904, the song is described as "absolutely and entirely different from the song of the Rose-breasted Grosbeak as it is heard when wild out of doors." The two male Grosbeaks had then for some time been kept in cages adjacent to a Hardwick's Bulbul, and by the middle of May their songs "were so close an imitation of the insistent song of the Bulbul that it was difficult, when not looking at the birds, to tell which species was singing."

¹ The Inheritance of Song in Passerine Birds. Remarks on the Development of Song in the Rose-breasted Grosbeak, *Zamelodia ludoviciana* (Linnæus), and the Meadowlark, *Sturnella magna* (Linnæus). By William E. D. Scott. Science, N. S., Vol. XIX, No. 495, pp. 957-959, June 14, 1904.

The Inheritance of Song in Passerine Birds. Further Observations on the Development of Song and Nest-building in Hand-reared Rose-breasted Grosbeaks, *Zamelodia ludoviciana* (Linnæus). *Ibid.*, Vol. XX, No. 504, pp. 282, 283, Aug. 26, 1904.

The birds mated with females provided for them, and about the middle of May showed a desire to build nests, and for some time busied themselves with "abortive attempts at nest-building." They proved unable to successfully adjust the materials supplied to them, and were finally furnished with artificial nests. They availed themselves of these, soon completing a lining and beginning to lay. Each female laid a full complement, but the eggs were broken by the birds, apparently by accident in their continued efforts to complete the nest structure to their liking. Each female laid another set of eggs, which shared the fate of the first set. Mr. Scott summarizes his observations on this case as follows: "While I am not prepared to conclude that the Grosbeaks would not have built a nest if furnished with more commodious quarters and nearer like the condition of affairs that exist out of doors, I conclude that so far as nest-building in cages is concerned they are unable to accomplish anything. So far as the song is concerned, I believe that they inherit the call-notes of both pleasure and fear, but that the song of the males was an imitation of a song of a bird that strongly impressed them during the period when they were cultivating this secondary sexual characteristic."

The account of the young Meadowlarks is less detailed. A male acquired a song "quite dissimilar to that of a wild Meadowlark," and accompanied the performance by what Mr. Scott calls "a parade or dance, analogous to the strut of a turkey-cock." A part of the song consisted of "a silvery whistling sequence of five or six notes rather long drawn out, and given with much precision," which so resembled a part of the song of a European Blackbird confined in the same room, that it was several weeks before Mr. Scott and his assistant were able to identify the real author of the strain.

In his comment on this case Mr. Scott says: "My conclusion is that birds are influenced in their early lives very strongly by any noise that arrests their attention, even in a wild state, and that this propensity to imitate and differentiate their normal methods of song is greatly exaggerated under the artificial state wherein they live when in confinement." — J. A. A.

Scott's Ornithology of Patagonia.— The first fasciculus of the ornithological volume¹ of the Reports of the Princeton University Expeditions to

¹ J. Pierpont Morgan Publication Fund | — | Reports | of the Princeton University Expeditions | to Patagonia. 1896-1899 | J. B. Hatcher in Charge | Edited by | William B. Scott | Blair Professor of Geology and Palæontology, Princeton University | Volume II | Ornithology | Part I. | Rheidæ-Spheniscidæ | By | William Earl Dodge Scott | Princeton University | associated with | R. Bowdler Sharpe | British Museum of Natural History | Princeton, N. J. | The University | Stuttgart | E. Schweizerbart'sche Verlags-Handlung (E. N. Gele) | 1904.— 4to, pp. 1-112. Issued July 26, 1904.

Patagonia, conducted by the late Dr. J. B. Hatcher, has made its appearance under the joint authorship of Mr. W. E. D. Scott of Princeton and Dr. R. Bowdler Sharpe of the British Museum of Natural History, and is thus likely to be well done and authoritative. The first part begins with the systematic portion, without any introductory matter, which, under separate pagination, will doubtless appear with the final part of the work. The basis of the present volume is the ornithological collections made by Dr. Hatcher and his principal assistants, Mr. Peterson and Mr. A. E. Colburn, incidentally to the main work of the Princeton University Patagonian Expeditions, which was to explore the geology and rich deposits of animal remains in Patagonia. The scientific results of these eminently successful expeditions will form twelve large quarto volumes, abundantly illustrated with plates and text cuts, and will be published at the expense of the J. Pierpont Morgan Fund. Several volumes have already appeared, including the narrative volume, by Dr. Hatcher, whose untimely death a few months ago is lamented as a most serious loss to science. His wonderfully successful researches in Patagonia were due to his indomitable perseverance, energy, and remarkable power of endurance, under grave hardships and adverse conditions. As a field explorer he had few equals, and he had also attained eminence as an investigator which presaged long years of useful work when disease suddenly cut short his career. In the narrative volume of the Expeditions he recorded many observations on the birds of the region visited, which we are glad to see are here utilized.

Naturally the classification adopted is that propounded by Dr. Sharpe and employed in his well-known 'Hand-List of the Genera and Species of Birds.' The families treated in the present brochure include the Rheidæ, Tinamidæ, Columbidae, Peristidae, Rallidae, Podicipedidae, and Sphenicidae, and include 29 species, occupying 112 pages, with numerous text cuts of heads, bills, feet, etc. Very full tables of bibliographical references are given, for the higher groups as well as the species, with technical descriptions of the species, followed by a brief paragraph giving the geographical range, and as much biographical matter as could be conveniently gathered from preceding writers, including Darwin's extended observations on many of the species included in the scope of this work. Although its exact geographical limits are not here stated, it is evidently intended to be a complete monograph of the ornithology of Patagonia, including the Falkland Islands. Hence only a small proportion of the species are represented in the collections made by the Princeton University Expeditions — only one fourth of those covered by Part I. In most cases, in fact, the descriptions are avowedly based on material in the British Museum, to which Mr. Scott took the specimens collected by the Princeton Expeditions for identification. The work has thus authoritatively determined material for its basis, and through the association of Dr. Sharpe in the authorship, such an authoritative standing that we may pardon even the use of emended names.— J. A. A.

Bryan's 'A Monograph of Marcus Island.'¹— Marcus Island is a small islet near the middle of the North Pacific Ocean (Lat. 24° 14' N., Long. 154° E.) described as "an ancient triangular atoll which has been elevated above the sea," with an area of about 740 acres, a coast line of about four miles, and an elevation in the interior, which is covered with heavy forest, of from 25 to 75 feet. The island was claimed for the United States by right of discovery, by Captain Rosehill, in June, 1889, and in July, 1898, was taken into possession by the Japanese, who later relinquished their claim in favor of the United States. It has guano deposits and cocoanut palms, but its economic importance is, of course, slight.

Mr. Bryan gives first an account of its discovery and location, especially with reference to other more or less mythical islands in the vicinity, and a history of recent attempts at its exploitation. Up to 1900 it appears to have been so little known that its exact location and physical characteristics were still in doubt. After a detailed description of its physical features, its geology and its meteorological conditions, Mr. Bryan, aided by specialists in various branches, proceeds to give an annotated list of the fauna, and some account of the flora, based on observations and collections made by him during a week's sojourn on the island in August, 1902, under the auspices of the Bishop Museum. The birds (pp. 77-116) number 18 species, all water birds, and most of them pelagic or marine species of wide distribution. Not only was no land bird met with, but Mr. Bryan satisfied himself that had "any existing terrestrial or arboreal bird been in any way introduced on the island, it would have perished for want of suitable food." Fifty-six specimens were taken, which, with his field notes, form the basis of the present list. One species, a tern (*Micranous marcusii*), is described as new, it differing, however, only slightly from *M. hawaiiensis*. At the time of his visit the Japanese had a naval officer and a party of marines on the island, and the military regulations imposed by them greatly hampered the work of his party and shortened its stay, and especially interfered with his bird collecting. The Japanese themselves, however, have been exceedingly destructive of bird life there for commercial purposes, particularly of the Sooty Tern (*Sterna fuliginosa*) which is the most abundant bird on the island. Mr. Bryan found their number beyond estimate; "probably" he says, "to say that there were hundreds of thousands would convey a conservative suggestion as to their abundance." The Japanese had a party of some thirty men engaged in collecting their skins for the New York, Paris, and Berlin millinery markets; and "during the six months from March to September not less

¹ A Monograph of Marcus Island, an Account of its Physical Features and Geology, with descriptions of the Fauna and Flora. By Wm. Alanson Bryan, B. Sc. Illustrated by a map, seven half-tone cuts and line drawings by the author. Occas. Papers of the Bernice Pauahi Mus., Vol. II, No. 1, 1903, pp. 77-139.

than 50,000 birds are there slaughtered as a sacrifice to the cruel goddess of fashion." Their method of prosecuting the work is described in detail. Also, "the story of the Marcus Island colony of Goonies (*Diomedea immutabilis*) is one of death and extermination." Disappointed in being unable "to find guano by their crude methods," the Japanese developed a scheme to make a marketable commodity of the Goonies, by killing them and boiling them down in great kettles to form a fertilizer which they shipped to Japan, saving, however, the long wing quills to sell as 'eagle feathers' for the decoration of women's hats, and the breast feathers were "plucked off and sold by the pound." Under this treatment the colony has greatly dwindled, and in 1902 the birds were only killed for their feathers.

Mr. Bryan's extended notes on the habits of a number of the species of birds are of especial interest and value. Besides two species of reptiles, a considerable number of crustaceans, and a large collection of mollusks, he secured some 60 species of fishes, a number of which proved new to science. His brief stay at Marcus Island has thus not only for the first time made the island really known to the world, but has given us a fair conception of its fauna and flora.—J. A. A.

Macoun's Catalogue of Canadian Birds, Part III.¹—The publication of Part III completes this important work, forming a volume of about 770 pages, and constituting the most extensive and valuable single contribution to Canadian Ornithology since the publication of the bird volume of the 'Fauna Boreali-Americana,' seventy-five years ago. We have so fully noted the character and scope of this work in our notices of Parts I and II (Pt. I, Auk, XVII, 1900, pp. 394, 395; Pt. II, Auk, XX, 1903, p. 441) that there is little new to say of it beyond the announcement of its completion. As already said, the work forms a compendium of the previously published information regarding the range and breeding areas of all the species and subspecies of birds known to occur in North America north of the United States, including those of Greenland and Alaska as well as those of Canada, supplemented by a large amount of hitherto unpublished material gathered by members of the Canadian Geological Survey, including contributions from a large number of trustworthy correspondents. The authorities are given for all the statements made respecting the manner of occurrence of all of the forms included

¹Geological Survey of Canada | Robert Bell, M. D., Sc. D., (Cantab.,) LL. D., F.R. S. | — | Catalogue | of | Canadian Birds | — | Part III | Sparrows, Swallows, Vireos, Warblers, | Wrens, Titmice and Thrushes. | Including the Order : | Passeres after Icteridæ | — | By | John Macoun, M. A., F. R. S. C. | Naturalist to the Geological Survey of Canada. | [Vignette.] Ottawa : | Printed by S. E. Dawson, Printer to the King's Most | Excellent Majesty | 1904 | No. 883 | Price ten cents.—8vo, pp. i-iv+415-733+i-xxiii.

in the 'Catalogue,' but it is not always clear whether the information given is new or taken from published sources, as the proposed bibliography of works consulted has been omitted, it having been found, perhaps, too voluminous for the space at the author's command. As a supplemental part, or 'addendum' "will, it is hoped, be published in the near future," to include the voluminous "notes on and references to the species included in the first two parts of this Catalogue," it may be that we shall have a bibliography in the proposed additional part. Part III closes with two pages of addenda and an index to the whole work.

Mr. Macoun has succeeded in bringing together and rendering available a vast amount of information on the distribution and habits of Canadian birds, and has thereby placed the ornithological world under grateful obligations.—J. A. A.

Todd on the Mammal and Bird Fauna of Beaver County, Pennsylvania.¹—Beaver County, in its faunal relationships, is Carolinian, a dozen or more characteristically Carolinian species of birds being enumerated by Mr. Todd as of common occurrence in the County. The lists are briefly annotated; the bird list numbers 178 species, and is believed to be fairly complete.—J. A. A.

Stone on Birds and Mammals from Mt. Sanhedrin, California.²—Mount Sanhedrin is in Mendocino County, California, and attains an altitude of 5,000 feet. The birds here recorded were collected by Mr. A. S. Bunnell of Berkeley, and number 56 species, with field notes on these and 33 others observed by Mr. Bunnell. As nothing had previously been published on the region, the present paper forms a welcome addition to the faunal literature of California.—J. A. A.

Raine on the Eggs of the Solitary Sandpiper.³—"At last," says Mr. Raine, "the long-sought for eggs of the Solitary Sandpiper have been found, and it affords me much pleasure to be the first ornithologist to have the opportunity of recording its nesting habits, which are unique amongst North American birds, for I have positive proof that this species lays its eggs in the [abandoned] nests of other birds." After considering

¹ The Mammal and Bird Fauna of Beaver County, Pennsylvania. By W. E. Clyde Todd, Custodian, Depart. Mammals and Birds, Carnegie Museum, Pittsburg, Pa. Bausman's History of Beaver County, Pa., Vol. II, 1904, pp. 1195-1202. Separates, dated Nov. 23, 1904. Birds, pp. 1198-1202.

² On a Collection of Birds and Mammals from Mount Sanhedrin, California. By Witmer Stone. Proc. Acad. Nat. Sci. Philadelphia, 1904, pp. 576-585. Oct. 17, 1904. Birds, pp. 580-585.

³ Discovery of the Eggs of Solitary Sandpiper. By Walter Raine. Ottawa Naturalist, Vol. XVIII, 1904, pp. 135-138. Published Oct. 20, 1904.

the several alleged discoveries of the eggs of this species — in ground nests — and showing that they cannot be taken as authentic, he proceeds to describe the taking of three sets of eggs by Mr. Evan Thompson, in northern Alberta, — one on June 16, 1903, in a deserted Robin's nest, another June 9, 1904, in the nest of a Bronzed Grackle, and the third on June 24, 1904, in the nest of a Cedar Waxwing. The second set was unfortunately destroyed, but of the third set he says: "Mr. Thompson was fortunate in shooting the parent bird as she flew from the nest and thus identification is very complete and establishes the fact once for all, that the Solitary Sandpiper does not lay its eggs in a nest on the ground like other sandpipers, but takes possession of the nest of other birds, built in trees, just the same as its Old World representative the Green Sandpiper is known to do." The eggs are described as being entirely different from those of the Spotted Sandpiper, but as bearing "family likeness to eggs of the European Green and Wood Sandpipers, as might be expected, but, of course, like the birds themselves, the eggs are much smaller than those" of the two species of European Sandpipers mentioned. The separate of Mr. Raine's paper is accompanied by a photograph of the two sets obtained, in situ in the nests, and also a memorandum in pencil to the effect that set No. 3 is now in the collection of the Hon. John H. Thayer of Lancaster, Mass. — J. A. A.

Riley on the Birds of Barbuda and Antigua.¹ — This paper is based "on a collection of 325 bird skins formed by Mr. H. G. Selwyn during the late summer, fall, and early winter of 1903, recently acquired by the United States National Museum," it constituting the largest single collection ever made on these ornithologically little-known islands. The collection adds several species new to the islands and one, *Dendroica subita*, new to science. This species belongs to the *D. adalaidæ* group, but is quite distinct from any previously known. The total number of species recorded from these islands is 51, respecting several of which there is extended critical comment. The form of *Butorides* represented is called *B. virescens maculatus* (Bodd.); the form of Little Blue Heron found there is designated as *Florida cærulea cærulescens* (Lath.); the Zenaida and Ground Doves are respectively, *Zenaida zenaida aurita* (Temm.) and *Columbigallina passerina trochila* (Bonap.); the Sparrow Hawk is *Cerchneis sparveria caribæarum* (Gm.), and a new subspecies, *C. s. loquacula*, is described from Porto Rico; of the Mangrove Cuckoos, three forms are recognized, one of which, *Coccyzus dominicæ* Shelley receives a new name, being called *C. m. shelleyi*, Shelley's name proving to be preoccupied; and there are a few other modifications of nomenclature.

¹ Catalogue of a Collection of Birds from Barbuda and Antigua, British West Indies. By J. H. Riley. Smithsonian Collections (quarterly issue), Vol. XLVII, 1904, pp. 277-291. Published Nov. 9, 1894.

Mr. Riley has also recently described a new flycatcher from Grenada and St. Vincent as *Myiarchus oberi nugator*.¹ — J. A. A.

Dubois's '*Synopsis Avium*.'²—Since our last notice of this work it has been concluded by the publication of fasciculi XIII–XVI, completing the Herodiones and containing the Grallatores, Palamedeæ, Anseres, Steganopodes, Gaviæ, Tubinares, Pygopodes, Impennes, Apteryges, Casuarii, Rheæ, and Struthiones; also the Supplement and the alphabetic tables, or indexes, to the genera, species and subspecies, and the systematic table of the orders and families.

According to the author's 'postface,' the '*Synopsis*' includes 12,509 species and 3969 subspecies, or a total of 16,478 species and subspecies, apportioned among 2252 genera. The orders number 23, and there are 145 families.

The author's plan and purpose, and the system of classification adopted, has already been explained in our notices of the first fasciculus (Auk, XVII, 1900, p. 81), and of Part I (Auk, XIX, 1902, p. 409). As said before, the '*Synopsis*' is constructed very nearly on the plan of the late G. R. Gray's '*Hand List of the Genera and Species of Birds*,' completed in 1871, and, including the 'supplement,' brings the subject down to the early part of 1902. The supplement (pp. 1053–1118) contains the genera, species, and subspecies, and many corrections of nomenclature, which appeared during the publication of the work (1899–1902) too late to be included in it, the new species and subspecies alone numbering respectively 510 and 642. It is the author's plan to issue additional supplements from time to time, thus keeping the work up to date. While the classification is far from modern, the author is to be congratulated on the completion of so arduous and useful an undertaking, which renders so conveniently accessible references to the original descriptions and figures of the world's ornis.—J. A. A.

Madarász's '*An Extraordinary Discovery in Ornithology*.'—This is a

¹ Description of a new *Myiarchus* from Grenada and St. Vincent, West Indies. Smithsonian Contributions (quarterly issue), Vol. XLVII, 1904, pp. 275, 276. Published Nov. 8, 1904.

² *Synopsis Avium* | — | Nouveau | Manuel d'Ornithologie | par | Alphonse Dubois | Docteur en sciences naturelles, | Conservateur au Musée Royal d'Histoire naturelle de Belgique, | Officier de l'Ordre de Léopold, | Membre du Comité internationale et permanent d'Ornithologie, | de la Commission permanente d'étude des Collections de Musée de l'Etat Indépendant du Congo, | Membre honoraire, correspondant ou effective de plusieurs Sociétés savantes. | — | Deuxième Partie | (1902–1904) | — | Bruxelles | H. Lamertin, éditeur | 20, Rue du Marché au-Bois. | — 1904—Roy. 8vo, pp.i–x + 731–1339, pll. col. xiii–xvi.

grallatorial passeriform bird,¹ obtained by Coloman Katona on the shores of Lake Jippe in East Africa, and here described as *Charadriola singularis*, gen. et. sp. nov. The terminal third of the tibia is unfeathered, scaled, and reticulated as in the plovers. In other respects this new type is much like the South African genus *Macronyx*, having the same long hind claw and other features, but a slenderer bill. The bird is illustrated by three text-figures, giving full-length figures of the male and female, the hind limb (natural size), and an enlarged figure of the tibia and proximal portion of the tarsus, to show the plover-like scutellation. In a notice of this paper in a recent number of 'The Ibis' (Oct. 1904, p. 653), however, the bird here described is said to be not a new discovery, but a redescription of *Tmetothylacus tenellus* Cabanis, and "that it is *not* an aquatic species!" Cabanis first described and figured the species as *Macronyx tenellus* (J. f. O. 1878, pp. 205, 220, pl. iii, fig. 2), and later (*ibid.*, 1879, p. 438) made it the type of a new genus *Tmetothylacus*, on the basis mainly of the nakedness of the lower half of the tibia and its scaly covering. Sharpe, in 1885 (Cat. Birds Brit. Mus., X, p. 618), referred the species to *Anthus* and cites the already considerable literature relating to it.—J. A. A.

Shalow on Arctic Birds.²—The area embraced in the present elaborate memoir is limited to the seas and islands north of the Arctic Circle. Some fifteen pages of introductory matter (pp. 81–96) treat of the faunal relations of the region, and the views of leading writers thereon, and define the limits of the region under consideration. The bibliography of the subject takes the next fifteen pages (pp. 96–110), the titles being arranged chronologically, beginning with Martens, 1675, and including a portion of the literature of 1904. A systematic enumeration of the species, subspecies and higher groups follows. The 270 species and subspecies are next treated (pp. 114–271) in due sequence under the subheading 'Die Geographisch Verbreitung der das nordliche Polarmeer bewohnenden Vögel,' under which is given for each the synonymy, bibliographic references, and a detailed account of its manner of occurrence in the region.

Following this, the main body of the work, is an analysis of the distribution of the species and subspecies in the different islands, with reference to their faunal relations,—whether circumpolar, palæarctic, or nearctic, and whether known to breed or not at the various islands in question.

¹ An Extraordinary Discovery in Ornithology. By Dr. Julius v. Madarász. Ann. Mus. Nat. Hungarici, II, 1904, pp. 396–398.

² Die Vögel der Arktis. Von Herman Shalow in Berlin. Fauna Arctica, eine Zusammenstellung der arktische Tierformen, mit besonderer Berücksichtigung des Spitzbergen-Gebietes auf Grund der Ergebnisse der Deutschen Expedition in das Nordliche Eismeer im Jahr 1898. Band IV, Lieferung I, Verlag von Gustav Fischer in Jena. 1904. — 4to, pp. 81–288.

The region is limited, as already said, to the area north of the Arctic Circle, and includes the following eleven islands and groups of Islands: (1) Bear Island, with 28 species and subspecies, of which 17 breed on the island. (2) Spitzbergen Archipelago, with 50, of which 25 breed, while 18 of the 50 are circumpolar. (3) Franz Joseph Land, 28, 16, and possibly 18, of which breed, while 18 are circumpolar. (4) Nova Zembla, 49, of which 18 are circumpolar. (5) Kolgnew, 51, of which 42, or 84 percent, breed, and 16 are circumpolar. (6) Dolgoi, 23, of which 18 are circumpolar and 18 breed. (7) Waigat, with 49, of which 29 breed, and 17 are circumpolar. (8) New Siberia, 50, of which 19 are circumpolar, 23 palæarctic, and 8 nearctic, and 37 breed. (9) Wrangel Island, 28, of which 15 breed, 12 are circumpolar, 10 'pacific-nearctic,' and 6 palæarctic. (10) Herald Island, 23, of which 14 breed, 8 are circumpolar, 11 'pacific-nearctic,' and 4 'Europæo-Asiatic.' (11) Greenland, 161, of which 20 are circumpolar, 83 palæarctic, and 58 nearctic, with 60 that breed. Of these 56 are common to both East and West Greenland; West Greenland has 153, of which 20 are circumpolar, 60 nearctic, and 73 palæarctic; East Greenland, 64, of which 17 are circumpolar, 9 nearctic, and 38 palæarctic. (12) Jan Mayen, 52, 18 of which are circumpolar, 4 nearctic, and 30 palæarctic, and 19 have been found nesting.

The ornithology of these different islands is very unequally known, some, like Jan Mayen, being very well known ornithologically, while others, like Dolgoi, Kolgnew, Waigat, etc., are very imperfectly known, so that the statistics for some of them include some more or less doubtful species. As will be seen, however, from the foregoing, in this critical examination of the arctic ornis the author has brought together a vast amount of exceedingly important and interesting information.—J. A. A.

NOTES AND NEWS.

DR. SAMUEL W. WOODHOUSE, a Corresponding Fellow of the American Ornithologists' Union, died at his home in Philadelphia on October 23, 1904. Although for many years retired from active work, Dr. Woodhouse's early life was full of adventure and his name was prominent among men of science and travel fifty years ago.

Samuel Washington Woodhouse was born in Philadelphia, June 27, 1821, the son of Com. Samuel Woodhouse, U. S. N., and H. Matilda Roberts. The family came from Northumberland, England, his grandfather emigrating to America in 1776.

Dr. Woodhouse was educated at private schools in Philadelphia and at

West Haven, Conn. For a time he engaged in farming, but later determined upon the study of medicine and matriculated at the University of Pennsylvania, graduating in 1847. He then became assistant resident physician at the Philadelphia Hospital, a post which he held for a year or more, when he resigned to become Surgeon and Naturalist to the U. S. Topographical Engineer Corps on the survey of the boundary between the Creek and Cherokee Indian nations.

From early life he had been enthusiastically interested in natural history, especially ornithology, and had visited the Academy of Natural Sciences. Here he became intimate with Thomas Nuttall, the botanist and ornithologist, J. K. Townsend, Drs. George Leib, Samuel G. Morton, Robert Bridges, Paul Goddard, Joseph Carson, Elwyn and Zantzinger, and other active members of the Society. On his farm he continued his study of ornithology, and under the instruction of Dr. Leib became skilful in the art of taxidermy, which was then an important part of the ornithologist's equipment. With these strong tastes it is not surprising that he preferred positions in which he could combine his love of nature with the sterner duties of the medical profession. Therefore, when Col. J. J. Abert, the chief of the Topographical Engineers, applied to Dr. Morton to recommend a doctor and naturalist, Woodhouse was only too anxious for the appointment. He reported in Washington in April, 1849, and reached Fort Gibson, where the expedition under Lieutenant Sitgreaves was to rendezvous, on June 6. The country traversed by the Survey was an unexplored section of the Indian Territory, and his collections were consequently of much importance to science. In the following year, under Lieutenant Woodruff, the survey was completed.

In 1851, again under Lieutenant Sitgreaves, Dr. Woodhouse was a member of the Zuni River Expedition, traveling from San Antonio, Texas, via El Paso to Santa Fé, and then west to the Zuni, which was followed to its junction with the Little Colorado, thence across the San Francisco Mountains and down the Colorado River to Yuma, reaching San Francisco early in 1852.

Much of the country was virgin soil to the naturalist, and Dr. Woodhouse secured many specimens, though he was seriously handicapped in his collecting by a rattlesnake bite which he received at the pueblo of Zuni. This hindrance to his natural history researches was, however, of importance from a medical standpoint, and he made a careful study of the effects of the bite and the result of his treatment.

At the close of this expedition, in 1852, Dr. Woodhouse returned to Philadelphia and prepared a report upon all the collections of birds and mammals obtained by him in the Southwest, and this treatise forms one of the most valuable pioneer contributions to the ornithology and mammalogy of our western States and Territories. Six new quadrupeds were described and named, and an equal number of novelties were discovered among the birds, while many other of Dr. Woodhouse's specimens proved later on to belong to undescribed forms. Some of these, such as the Woodhouse's Jay (*Aphelocoma woodhousei*) have been named in his honor.

His next position was that of surgeon to the Inter-ocean Canal, Railroad, and Mining Company Expedition to Nicaragua and Honduras, covering the years 1853-1854, when he traveled over the route to Lake Nicaragua, since made famous by the more recent advocates of the Nicaragua Canal.

Returning from this enterprise Dr. Woodhouse became surgeon at Fort Delaware from 1854 to 1856 and later, 1859-1860, was surgeon on Cope's Line of Packets plying between Philadelphia and Liverpool.

In 1872 Dr. Woodhouse married Miss Sarah A. Peck, and is survived by two children. The last of his generation of scientific men, he had been for many years in retirement, as it were, and out of touch with the leaders in his favorite study, but more recently he became associated with the younger ornithologists of the present day and attended two Congresses of the American Ornithologists' Union, and many meetings of the Delaware Valley Ornithological Club, where his reminiscences of the older bird students were received with deep interest; his stories of Nuttall, combining his hobbies by digging up plants with his gun-barrel, and the details of the capture of rare birds where city streets and blocks of houses now stand, were ever interesting themes.

His earnest attention to papers and communications and his interest in every new discovery gave evidence that the enjoyment of these meetings was not all on one side, and the revival of the favorite pastime of his youth seems to have added not a little to his pleasure and to have cast a brighter glow over the closing years of a life as full of action and adventure as it was marked by modesty and earnestness. — W. S.

JOHN COWING KNOX, of Jackson, Minnesota, an Associate of the American Ornithologists' Union, was drowned in Shoal Lake, Manitoba, Canada, on June 10, 1904. Mr. Knox was one of a party of three, and had started to row from the mainland to a small island three miles distant. When about two miles from shore a gale sprung up and the boat went over. This occurred at nine in the morning. The three occupants clung to the boat and tried to swim and push the boat to shore. This failed, and at two o'clock in the afternoon one of the party dropped from the boat from exhaustion and sank. Mr. Knox managed to hang on until two-thirty, when he, too, relaxed his hold and sank. The third member of the party managed to cling to the boat until it finally drifted ashore at eleven o'clock that night, and was rescued. The two bodies were recovered several days later. Mr. Knox was twenty-five years of age, and had just recently gone into partnership with his father, in law business. He was a graduate of the University of Minnesota in 1900, and of the Law Department of the same university in 1903. He had been interested in ornithology since childhood, and had formed an excellent collection of eggs of Minnesota birds. He had long planned this ornithological outing to Canada, which came to such a sudden and sad ending. He was an excellent student, and very popular with his friends, having a warm, open-hearted nature. — W. T. M.

TWO BIRD groups which are nearing completion in the American Museum of Natural History are believed to exceed in beauty, in scientific accuracy, and in educational value anything of the kind which has heretofore been attempted.

The first group is designed to represent the bird life of the irrigated portion of the San Joaquin Valley in California, near Los Baños. Material for this group was collected by Mr. Frank M. Chapman in May and June, 1903. Mr. Chapman was assisted by Mr. Louis A. Fuertes, whose sketches from life and whose paintings of the soft parts of birds proved of the greatest value to the taxidermists; Mr. John Rowley, formerly chief of the Department of Taxidermy of the American Museum of Natural History, who prepared models of the characteristic vegetation of the region; and Mr. C. J. Hittell, the well-known San Francisco artist, who painted a background representing the Valley with the Coast Range in the distance.

The group will contain the Avocet, Stilt, Killdeer, Mallard, Cinnamon Teal, Coot, and Black Tern, all with newly hatched young, and also Forster's Tern, the Ruddy Duck, the Pintail, the Fulvous Tree Duck, the Red-head, the Black-crowned Night Heron, and the White-faced Glossy Ibis. All these species were abundantly represented in the irrigated section, their presence or absence depending largely upon the distribution of water.

The group is twenty feet long, nine feet wide, and ten feet high, and will contain about eighty individuals of the species mentioned. The birds have been successfully mounted by Mr. H. S. Denslow and the aquatic vegetation, consisting of over ten thousand leaves, has been prepared at the American Museum of Natural History, and is a facsimile reproduction of the actual plants. Doubtless no more difficult subject has previously been attempted in this line of bird exhibits, but the group is already sufficiently near completion to place its success beyond question.

A second, and even more remarkable group, which will be opened to the public some time during the present month, will represent the nesting habits of the American Flamingo. This group is also based upon Mr. Chapman's studies from life, and perhaps better than any other group of birds which we can now recall, illustrates the importance of detailed studies in nature as a basis for an accurate representation of the nesting habits of a bird.

Mr. Chapman made two trips to the Bahamas before he succeeded in finding an occupied colony of Flamingoes. On the second journey to these islands, in the spring and summer of 1904, a fully occupied colony of birds was discovered, and a large series of photographs was made, portraying very satisfactorily the heretofore unknown nest-life of this remarkable species. Specimens were also secured, representing not only the adults, but the newly-hatched chick, which illustrate its development to about the age of one month.

Great difficulty was experienced in collecting newly-made nests of the Flamingo. On a former trip Mr. Chapman secured nests which had been built the previous year and, at the beginning of the rainy season, were sufficiently sun-baked to permit of their successful transportation to New York City. Newly-made nests, however, were found to be water-soaked by almost continuous rains, and not only was their weight therefore greatly increased, but an attempt to remove them generally resulted in their disintegration. This emergency having been anticipated, a canvas canoe was taken to the rookery, into which the nests were directly removed after having been placed upon boards. Without further handling, the canoe itself being lifted upon the deck of the schooner in which Mr. Chapman travelled, the nests were conveyed directly to Nassau where they were cast by Dr. B. E. Dahlgren, Chief of the Museum's Department of Preparation. The surface structure and modelling were, therefore, perfectly preserved, and the plaster models subsequently made from these casts were covered with characteristic Bahaman marl, of which the nests themselves are composed. The result is a perfectly satisfactory and accurate representation of the Flamingo's nest, far less perishable than the nest itself, which experience has shown crumbles very quickly when exposed to steam heat in the Museum.

The group of Flamingoes which the Museum is now about to place upon exhibition will contain some seventeen adult birds, with young in various stages of development. The pose of each bird, whether feeding or brooding its young, incubating or roosting in various poses, is based upon photographs from life, and is, therefore, true to nature. It was recognized, however, that, even with the greatest care in the production, such a group would come far short of representing the conditions under which the birds live, if it could not be shown as the foreground of a colony of from fifteen hundred to two thousand pairs of these brilliantly colored birds. Accordingly the services of Mr. Fuertes, who accompanied Mr. Chapman upon his first trip to the Bahamas, were secured to paint upon a canvas, twenty feet long and ten feet high, a representation of the nesting colony, which, in connection with the birds represented in the group would give a graphic idea of a populous Flamingo rookery.

Mr. Hittell's work in connection with the *Los Baños* painting, previously mentioned, was so successful that he was induced to come to New York from San Francisco to paint the landscape for the background of the Flamingo group. So satisfactorily have these artists coöperated that the result of their combined efforts has met with the approval not only of artists but also of naturalists.

The successful completion of these two elaborate, exceedingly difficult and striking groups is due not alone to the skill of the artists, taxidermists, and modellers who have so effectively contributed to their construction, but primarily to the foresight, energy, and intelligence of the Associate Curator of this Department, Mr. Frank M. Chapman, who conceived their execution, secured the materials that compose them, and

directed the work in all its details. Especially is this true of the Flamingo group, which has entailed on Mr. Chapman's part indomitable perseverance, much hardship, and field-craft of the highest order. The locating, after many discouraging experiences, of this immense Flamingo colony, its successful invasion with a novel photographic equipment, and a sojourn for days almost within hand-reach of the brooding birds, is a triumph of tact and skill, buoyed by unflagging enthusiasm, unparalleled in the annals of ornithological exploration. How it was accomplished has been modestly told by Mr. Chapman in an article in the 'Century Magazine' for December, 1904, which strikingly illustrates, with its many photographs, the home life of the Flamingo in its Bahaman home. There is now little left to imagine in the domestic life of this striking and peculiarly interesting bird, the camera has so fully revealed the long-hidden mysteries of its manner of reproduction. There is no longer any doubt that it sits on its nest as do other birds, and does not straddle it with a leg hanging down on either side, as formerly believed. The young have been found to have a general resemblance to young fluffy ducklings, but to be less precocious, being fed for several days in the nest by the old birds; on the other hand they are not so helpless and are less altricial than the Heron tribe, with which and with the Anseres they were formerly alternately placed by the systematists. The younger stages of their infantile life and their subsequent development are now not only for the first time made known, but the most important period of their life history is fully portrayed in a museum group, forming one of the most interesting and instructive ornithological exhibits ever placed before the public.

THE SECOND edition of Henry Reed Taylor's 'Standard American Egg Catalogue' will doubtless be warmly welcomed by not only egg collectors but by others, as it gives the A. O. U. Check-List numbers, and the technical and common names to date, arranged in proper sequence. It contains also a Directory of some sixty or seventy of the leading collectors, and a dozen pages of introductory matter of general interest to oölogists.

FOR several years past there has been a National Committee of Audubon Societies, made up of representatives of each of the State societies, with Mr. William Dutcher as Chairman. The purpose of this Committee was to secure coöperation and unity of interest between the several State organizations. As the field of activities has broadened and the importance of the undertaking has steadily increased, it has seemed more and more desirable to centralize the work of bird protection in a national organization, and accordingly steps have been taken, and are now about completed, for the incorporation of a National Association of Audubon Societies. The National Association will be incorporated under the laws of New York, and the headquarters of the Association will be in New York City. The management will be vested in a board of thirty directors,

chosen from the several State societies, with, in all probability, Mr. Dutcher as the active head of the new organization, as it is through his energy and zeal as Chairman, both of the National Committee and of the A. O. U. Committee for the Protection of Birds, that the work of bird protection has been for years past so effectively and successfully advanced. It is the purpose of the new organization to secure funds, not only for present use, but for permanent endowment, so that the work may be established on a secure foundation for many years to come; for all who are in touch with this great and beneficent enterprise must know that the fight for the protection of birds and other useful animals must be a perpetual strife against unwise legislation and selfish and short-sighted interests. The management of the new organization, has already secured the services of Mr. T. Gilbert Pearson, of Greensboro, N. C., to take the field as a propagandist in the cause of bird protection, to awaken public interest and secure financial assistance for the National Association, for which special work he is eminently fitted by his energy and earnestness, and his well-known effectiveness as a public speaker.

THE WORK of the A. O. U. Committee for the Protection of North American Birds has not only been very aggressive during the past year but the results achieved have been extremely important and gratifying, as shown by the following summary, kindly prepared by the Chairman, Mr. William Dutcher, for publication in the present connection.

As usual the Committee has directed its efforts along three lines, the first of which, Warden work, has been continued with funds procured through Mr. Abbott H. Thayer; without such financial support this branch of the work could not be carried on at all, as it is impossible to secure the services of wardens unless they are paid a small salary during the time they are actually guarding the birds in the breeding season.

In Maine the colonies of Herring Gulls, Terns, Black Guillemots, and Puffins are rapidly increasing. All of the reports received, not only from the wardens themselves but from interested outsiders, show that the protected birds are becoming uncommonly fearless of man. While it is true that the conditions for bird protection on the Maine coast are extremely favorable, the large increase in their numbers is entirely due to the care given to the breeding birds by this Committee.

In Massachusetts the results are practically the same; the Terns on Penckese, Muskeget and the Weepecket Islands are doing finely, as are also those in the two colonies on Gardiner's Island, in New York State.

In New Jersey the colonies of Laughing Gulls and Terns made a small increase, but the conditions there are unfavorable, for the reason that the coast is becoming more densely populated every year, especially during the summer months, and the shores are being taken up for resident purposes, thus contracting annually the area occupied by the birds. The New Jersey colonies were very small when the Committee commenced to protect them and it is very doubtful whether they can be continued; it

is probable that Laughing Gulls and Terns will eventually cease to breed in the State, although by careful protection this unfortunate result can be indefinitely postponed.

In Virginia it is believed that the birds are not only holding their own but are slowly gaining in numbers; this applies especially to the Laughing Gull and Least Tern; the Chairman made an extended trip along the Virginia coast during the past breeding season and was astonished to note the extent of the territory occupied by the birds; it is practically worthless for any purpose except as a breeding resort. With care and the creation of a proper sentiment regarding the æsthetic and economic value of birds it will be easy to not only maintain but rapidly increase the birds of this coast.

In North Carolina all of the colonies made a large increase, owing to the splendid work of the Audubon Society. This Society is unique in its character, as its charter confers on it the powers of a Fish and Game Commission.

In Florida four wardens were employed; one during the entire year and the others during the breeding season only. In the localities in charge of these wardens the birds made a normal increase; in other parts of the State, however, the conditions were not so satisfactory. A commercial collector was detected shipping skins of Ivory-billed Woodpeckers from the State contrary to law; he was arrested, but has not yet been tried. As the Ivory-bills are on the verge of extinction it is extremely important that this man should be convicted as a warning to all persons who collect birds for commercial rather than scientific purposes.

A warden was employed in Texas for the first time during the past year; he was stationed near Matagorda Bay. Undoubtedly there are a number of colonies of birds on the Texas coast that should be protected but they cannot be located unless a bird survey is made; it was impossible to make such a survey during the past year owing to lack of funds.

The large colony of Herring Gulls in Lake Superior was again protected, and the Committee joined with the game commission of Oregon in giving special protection to the water birds that breed in the numerous shallow lakes in the southeastern portion of that State.

Several other colonies of birds were discovered during the past year that it is purposed to protect with wardens during the coming season.

The second line of work is legislation. During the past year the A. O. U. model law was adopted in two very important States, viz., Mississippi and Louisiana. In the latter State, in addition to the law protecting the non-game birds, a very drastic statute was passed protecting game birds.

This new legislation in Louisiana has an influence reaching far beyond the confines of the State, inasmuch as it stops the sale of native caged birds throughout the United States; nearly all of the Mockingbirds, Cardinals, Nonpareils, and Indigo Buntings that were sold by dealers came from Louisiana, and the cutting off of the supply of these birds actually stops the traffic in other parts of the country.

Efforts were made to secure the passage of the A. O. U. model law in Iowa and Vermont, but both attempts were unsuccessful.

In New York State a determined effort was made by the professional gunners of Long Island to repeal the anti-spring shooting wild fowl law; but, owing to the opposition of the sportsmen of the rest of the State, aided by the Committee, this important law is still in force. At the last election, however, the repeal of this law was made a political issue on Long Island and the battle will have to be fought again at the coming session of the legislature.

In New Jersey the law preventing the shooting of snipe and shore birds during the spring migration was repealed, notwithstanding all of the efforts of this Committee to prevent it. An attempt was also made to remove protection from Robins, on the ground that they were destructive to fruit; this, however, was not successful.

As heretofore, the Committee has fostered the Audubon movement as much as possible; during the past year one very active society was organized and is now successfully working in California. Many of the other State Audubon Societies are rapidly increasing in size and strength and are doing more effective work than ever in creating favorable sentiment and educating the public as to the value of bird life.

A detailed report of the joint work of this Committee and of the National Association of Audubon Societies will be published in the February number of 'Bird-Lore,' the official organ of the Societies; separates of this report will be mailed free to members of the American Ornithologists' Union on request sent to any member of the Committee.

The Committee for the following year is as follows:

WILLIAM DUTCHER, Chairman, 525 Manhattan Ave., New York, N. Y.

ABBOTT H. THAYER, Monadnock, N. H.

RALPH HOFFMANN, Belmont, Mass.

ROBERT W. WILLIAMS, Jr., Tallahassee, Fla.

FRANK M. MILLER, New Orleans, La.

FRANK BOND, Cheyenne, Wyoming.

Mrs. FLORENCE M. BAILEY, Washington, D. C.

EDWARD B. CLARK, Chicago, Ills.

T. GILBERT PEARSON, Greensboro, N. C.

Mrs. LOUISE MCG. STEPHENSON, Helena, Arkansas.

A. W. ANTHONY, Portland, Oregon.

Subcommittee on Laws.

Dr. THEODORE S. PALMER, Washington, D. C.

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Old
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CONTINUATION OF THE
BULLETIN OF THE NUTTALL ORNITHOLOGICAL CLUB

New
Series,
Vol. XXII

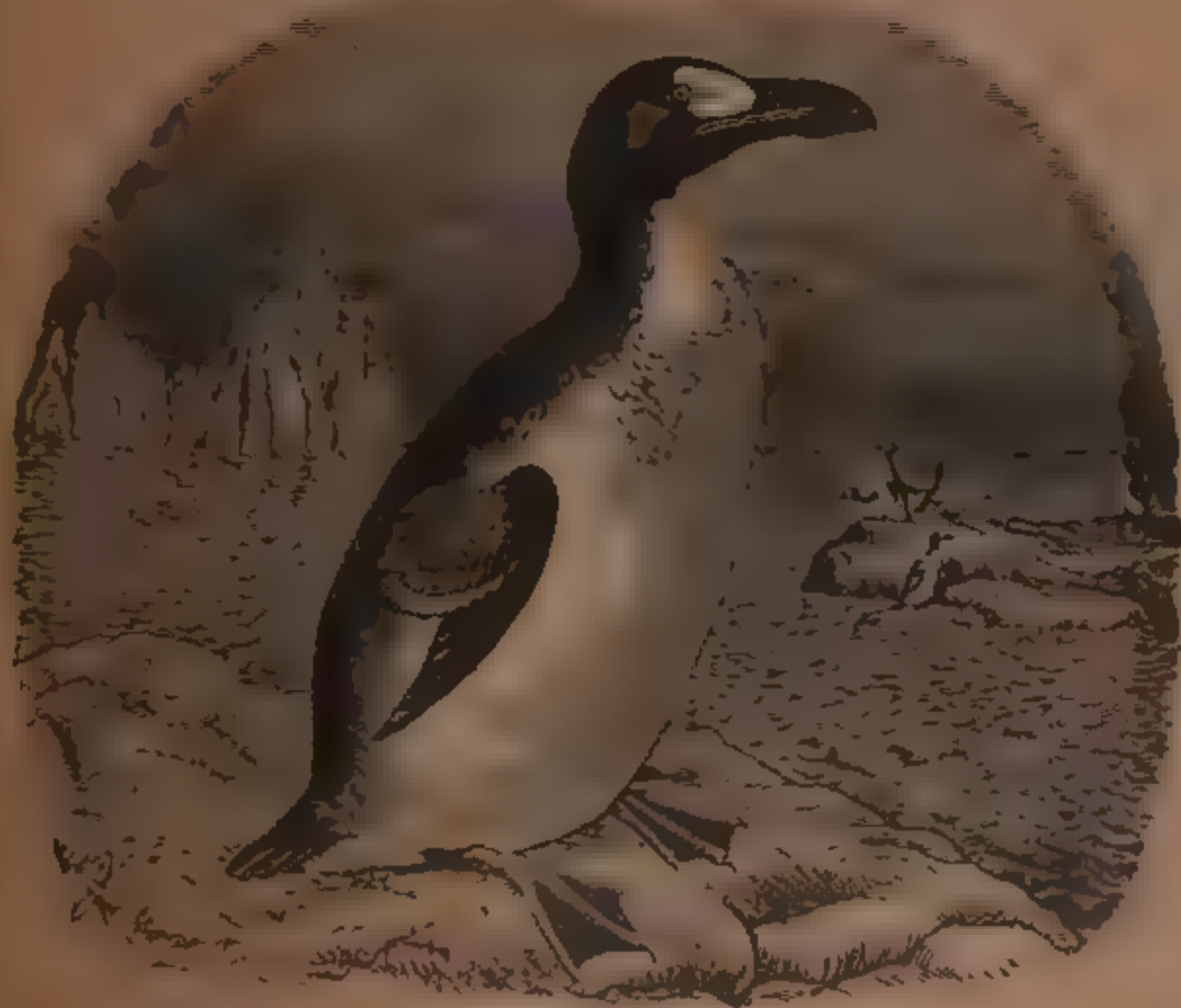
Univ. of
Apr 1905

The Auk

A Quarterly Journal of Ornithology

Vol. XXII — APRIL, 1905 —

No. 2



PUBLISHED BY

The American Ornithologists' Union

CAMBRIDGE, MASS.

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'THE AUK' published quarterly as the Organ of the AMERICAN ORNITHOLOGICAL UNION, is edited by Dr. J. A. ALLEN, with the assistance of Mr. FRANK M. CHESMAN.

TERMS.—\$3.00 a year, including postage, strictly in advance. Single numbers, 75 cents. Free to Honorary Fellows and to Fellows, Members and Associates of the A. O. U. and to correspondents.

Subscriptions should be addressed to DR. JONATHAN DWIGHT, Jr., BUSHYCK MOUNTAIN, EAST 3110 ST., NEW YORK, N. Y. Foreign Subscribers may address THE AUK through R. H. PORTER, 7 PRINCES STREET, CANNON SQUARE, W., LONDON.

All articles and communications intended for publication and all books and publications for review should be sent to Dr. J. A. ALLEN, AMERICAN MUSEUM OF NATURAL HISTORY, 77TH ST. AND CENTRAL PARK WEST, NEW YORK CITY.

Manuscripts for general publication should reach the Editor at least six weeks before the date of the number for which they are intended, and manuscripts for 'General Notes and Recent Literature' not later than the first of the month preceding the date of the number in which it is desired they shall appear.



FIG. 1. CAY VEGETATION, GREAT GUANA CAY

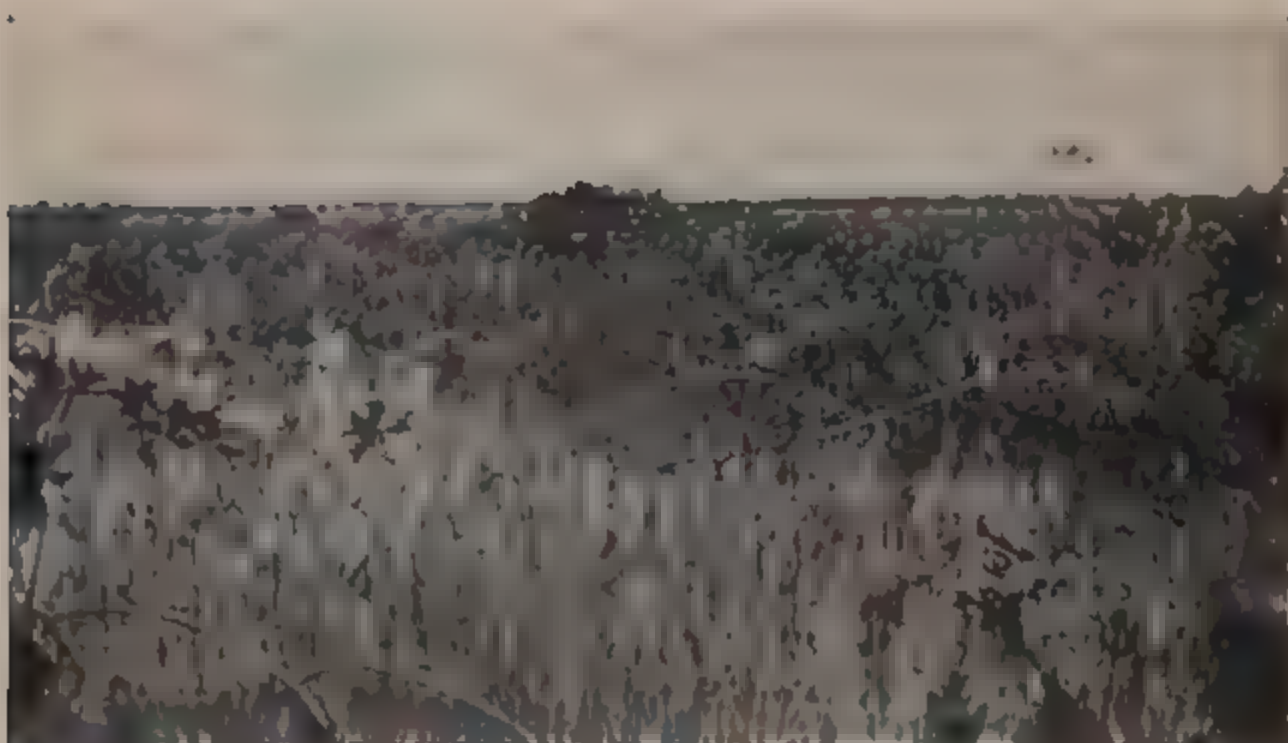


FIG. 2. OUTER EDGE OF MANGROVE SWAMP, GREAT BAHAMA

THE AUK:

A QUARTERLY JOURNAL OF

ORNITHOLOGY.

VOL. XXII.

APRIL, 1905.

No. 2.

SUMMER BIRDS IN THE BAHAMAS.

BY GLOVER M. ALLEN.

Plate I.

THIS is the third of a series of short papers on the results of a visit to the northern Bahamas in July, 1904, made by the writer in company with Mr. Thomas Barbour and Mr. Owen Bryant.

Notwithstanding that the birds of the Bahamas are now fairly well known, the following account of the species observed during our cruise among the cays and larger islands of the northern part of the group is of interest partly because most of the ornithological work in this region has been done in the winter and spring, and partly because these northern islands are apt to be neglected by visitors who pass at once to those of the more southern and eastern groups. Indeed, the summer avifauna of Great Bahama and the northeastern cays is very little known. Mr. F. M. Chapman, so recently as 1891, wrote that of "Great Bahama we know nothing; no ornithologist has ever visited it."¹ Later in the same year, however, Cory² published a list of birds obtained by his collector, C. S. Winch, at Great Bahama and Abaco, in March and June. Mr. Robert Ridgway³ listed the specimens obtained in March and April from Abaco and the more southern islands by

¹ Chapman : Amer. Naturalist, Vol. XXV, 1891, p. 536.

² Cory: Auk, Vol. VIII, 1891, pp. 298, 350.

³ Ridgway : Auk, Vol. VIII, 1891, p. 333-339.

the naturalists of the Fish Commission steamer 'Albatross,' and Mr. J. L. Bonhote¹ has also reported on a collection of birds made during the winter of 1901-02 among the northern Bahamas.

From June 28 until July 28, the writer, in company with Messrs. T. Barbour and O. Bryant, was engaged in studying the bird life in the vicinity of Nassau and, more particularly, of Great Abaco, Little Abaco, Great Bahama, and the chain of cays along the northern shores of these latter islands. Altogether, some three weeks were spent cruising among the northern Bahamas. During the first week of August, Mr. Bryant also visited Andros, and a few notes are here included based on his collections there.

Among the spongers or 'conchs' of the northern Bahamas, the larger islands, — Great Abaco, Little Abaco, Great Bahama, — are termed the 'Mainland,' while the fringe of small islands to the north and east are the 'wind'ard' cays, and those to the south and west the 'leeward' cays. The majority of the windward cays are small islands but a few feet above tide-water, covered with sand and supporting a tangled growth of scrubby bushes, palmettos, and small trees, here and there bound together by matted creepers. This is called 'coppet' by the natives. Often there is a narrow strip of more open ground just back of the beach, thinly covered with coarse grass and weeds, though in other places a thicket of mangroves may extend out to low-tide level or even slightly beyond. Many of the smallest cays are simply jagged rocks with a little grass growing here and there.

The larger 'main' islands support extensive tracts of open pine barrens, with a thick undergrowth of vines and bushes. Clearings have been made here and there, and pineapples, sweet potatoes, sugar cane, and other subtropical products are grown on a small scale, although the soil is thin and quickly becomes exhausted. In certain parts of these larger islands a number of deciduous trees thrive and often form a fairly respectable forest.

The seemingly barren cays afford a home for a large number of birds. Sooty, Bridled, Noddy, and Roseate Terns nest in the grass of the more open portions; Wilson's Plovers haunt the sea beach, and Nighthawks frequent the dry strip of open ground

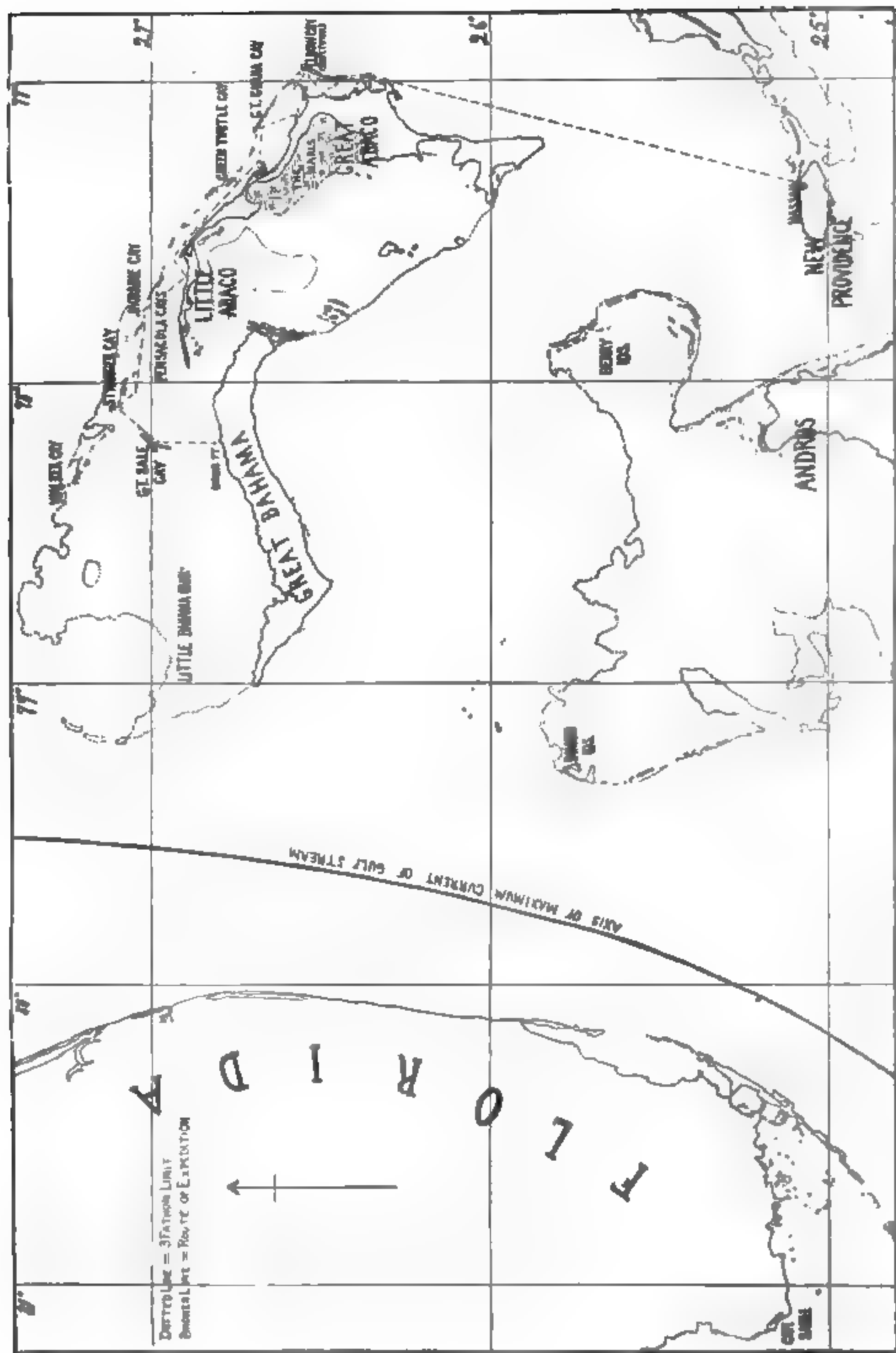
¹ Bonhote: *Ibis*, Ser. 8, Vol. III, 1903, p. 273-315.

just back of the shore. Among the thick growth of bushes are to be found Honey Creepers, Thick-billed Vireos, Yellowthroats, and the Bahama Mockingbird. Numbers of White-headed Pigeons breed on some of the cays, while Bahaman Red-wings, and Gray Kingbirds inhabit the edges of the thickets and the mangrove swamps.

On the large islands, the pine woods afford a home for Blake's and Hairy Woodpeckers, Pine Warblers, Bahaman Warblers, and other species. Some birds are of common occurrence in nearly all situations; for example, the Gray Kingbird, the two Hummingbirds (in the northern islands), and Honey Creepers.

The resident avifauna of the Bahama Islands is of considerable interest. Mr. Chapman, in his important paper on the origin of this fauna, has distinguished four classes of resident species: (1) those representing forms of general distribution, (2) those which occur as island forms of continental species, (3) those of purely West Indian origin, (4) represented by the Bahaman Swallow, a genus peculiar to the group. He points out that although the northernmost islands of the Bahama group are over one hundred miles farther north than the southern point of Florida, and are separated from that peninsula by only 60 miles of water, yet there is almost no tendency on the part of the Bahaman species to cross to the continent, and this notwithstanding that the prevailing winds are favorable for such flights. One reason for the failure of these island species to occur elsewhere is doubtless that many of them are thicket frequenters and hence would rarely be blown from their normal habitat. The uniform presence of many West Indian species throughout the islands, even to the most northern of the group, is a striking feature, and serves to emphasize the distinctness of this fauna from that of the adjacent mainland.

Several of the species of birds common to the Bahamas as a whole, show a tendency to become differentiated into local races on some of the groups. Thus certain of the birds of the northern Bahamas differ from the corresponding varieties of New Providence and its immediately neighboring islands, so as to be recognizable as distinct subspecies, but with one possible exception, such birds do not differ subspecifically on the *different islands* of this group. Thus the Hairy Woodpecker of Great Bahama, Little



Abaco, and Abaco is uniformly different from the true *maynardi* of New Providence. *Spindalis zena townsendi* is the *Spindalis* of the northern group. It occurs on the larger islands, and is quite distinct from true *zena* of the more southern islands. The Abaco Pine Warbler is the same as that found among the pine woods of Great Bahama, and is represented on New Providence by the quite distinct race *achruster*. Tanner's Yellowthroat is to be found in summer throughout the bushy parts of the larger islands and cays of the northern Bahamas, and was the only Yellowthroat we found. It is not known to occur elsewhere. The reason for this homogeneity among birds of the northern Bahamas is doubtless that the land masses are practically contiguous or only separated from one another by slight stretches of quiet water, while between them and the more southern groups (New Providence, etc.) some 40 or 50 miles of rough sea intervene.

According to Cory,¹ the *Centurus* of Great Bahama Island is subspecifically distinct from that found on Abaco. In view of what has just been said this is rather unexpected, and as the characters claimed for the Great Bahama bird are very slight, it is not unlikely that a large series would show the same variations on both islands.

In the following list, a few notes are included on birds seen during the voyage between New York and Nassau. The local names of the birds are also appended in quotation marks.

1. *Larus atricilla* Linn. LAUGHING GULL; "GULLIE."—Throughout the smaller cays and along the shores of the larger islands these birds were rather common in pairs, and were breeding. Most of those seen apparently had young near by, and invariably followed us with cries of protest whenever we were near their nesting sites. We saw a number of young birds that were evidently but a few days old, yet able to scramble nimbly about over the rough rocks.

2. *Sterna maxima* Bodd. ROYAL TERN; "RED SHANK."—Royal Terns were not uncommon about the islands, though we rarely saw more than two or three at a time flying over the quieter waters or sunning on the mud flats. We found no sign of their breeding.

3. *Sterna dougalli* Montag. ROSEATE TERN; "BLACK SHANK."—Rather common among the outer cays where it was breeding in early

¹ Cory: Auk, Vol. IX, 1892, p. 270.

July. The local name "Black Shank" is derived from the fact that the bird's beak is black, whereas the Royal Tern, with a reddish bill, is the "Red Shank."

4. *Sterna antillarum* (Less.). LEAST TERN; "KILL-'EM-POLLY."—On several of the smaller islands this little tern was breeding, and we found eggs during the first week of July near Elbow Cay. Although we found no large colonies, yet the bird was constantly met with in small numbers throughout our cruise. Several times they were seen with flocks of other terns following schools of small fishes.

5. *Sterna fuliginosa* Gmel. SOOTY TERN; "EGG BIRD."—Abundant among the smaller islands.

6. *Sterna anæthetus* Scop. BRIDLED TERN; "EGG BIRD."—One adult ♂ shot July 4, 1904, at Long Rock, off Abaco. The natives apply the term "Egg Bird" indiscriminately to these two species. We were not always able to distinguish between the two and did not wish to shoot the birds unnecessarily. At several places, notably at Fish Cays, we found immense numbers of terns breeding, most of which were seemingly Sooties. Many young birds were seen still in the down during July, while eggs were also plentiful. The crews of the sponging vessels gather quantities of these eggs for food during their voyages among the islands. Several of the young birds were captured and kept aboard our vessel during the cruise. They made interesting pets as they ate eagerly, were active and inquisitive, and wholly without fear. Their constant peeping, however, became eventually quite distracting.

7. *Anous stolidus* (Linn.). NODDY.—At Fish Cays, on July 14, we saw a number of Noddies among the hundreds of other terns of the two preceding species. This was evidently a large breeding colony. Elsewhere we saw Noddies on only a few occasions and in small numbers.

8. *Puffinus gravis* (O'Reilly). GREATER SHEARWATER.—On the afternoon of the second day out from New York (June 25), and some 250 to 300 miles south of that port, we began to see shearwaters in small numbers. Most of them were apparently of this species and usually appeared singly, flying in their characteristic manner, at some distance from the vessel. Sometimes two or three would pass by together, and once we saw a flock of eight. Only one was seen during the last day of the voyage to Nassau. Very few were observed on our return trip to New York, the first one making its appearance some 300 miles north of Nassau, off Georgia.

9. *Puffinus lherminieri* Less. AUDUBON'S SHEARWATER; "PIMLICO."—Although this shearwater breeds commonly in the Bahamas earlier in the season, we found none nesting at the time of our visit. Occasional individuals of what appeared to be this species were seen at sea with the preceding species. A few were also seen at nightfall as we left Nassau in our schooner, July 3, but otherwise we saw none among the islands during our cruise save for a single female which was captured under a rock on Pelican Island late in the afternoon of July 14. Several times loud cries

were heard overhead at night as we lay off shore which probably came from these birds, though as noted by Mr. Bonhote, the cry is very similar to that of the Sooty Terns.

10. *Oceanites oceanicus* (Kuhl). WILSON'S PETREL.—Petrels were seen from the first morning out of New York until we had crossed the Gulf Stream off Hatteras. During this time large flocks of from 30 to 50 birds were occasionally seen, while a few were almost constantly observed flying zig-zag back and forth over the steamer's wake some hundred yards or more astern. After entering upon the Gulf Stream and the warmer waters to the south, only one or two single birds were seen, the last being in about lat. 28° N. Cory, while cruising among the Bahamas at an earlier time of the year, found petrels abundant at a short distance off the coast, which might indicate that the birds were at that time passing through the latitude of the Bahamas and by July, when we made our trip, the main flight had passed still farther to the northward. On our return voyage, July 28–31, the first petrels, three or four in number, were observed after crossing the Gulf Stream off Hatteras Light, but they did not become common until we were within some 300 or 400 miles of Sandy Hook.

11. *Phaëthon americanus* Grant. YELLOW-BILLED TROPIC BIRD; "TROPIC."—But few Tropic Birds were seen among the northern Bahamas. At Hurricane Hole, near the northeastern end of Great Abaco, a small colony was nesting and a few other birds were seen about some of the rocky islets near Elbow Cay.

12. *Sula sula* (Linn.). BOOBY.—Mr. Bryant obtained a single immature specimen near Andros Island about August 1.

13. *Phalacrocorax dilophus floridanus* (Aud.). FLORIDA CORMORANT; "CORMORIL."—This appears to be an uncommon and local species at the present day among the northern Bahamas. We found but three small rookeries. The first of these was visited by Messrs. Barbour and Bryant, July 7, and consisted of some ten pairs of birds which were breeding on the south side of Great Abaco. On July 16, at Great Sale Cay, we came upon a small colony of less than half a dozen pairs. Four or five new nests were discovered about 15 feet up, in the tops of some large mangroves by the water's edge. Only three of these nests were in use, apparently. Two held newly hatched young while the third contained one egg and one very young bird. A small isolated clump of mangroves near the nests may have been used as a roost by the non-incubating birds for its thick branches were well whitewashed with excrement. A third small colony of cormorants was found at Great Bahama, near Riding Point, but we were told that the birds were then through breeding. Two adult specimens which we secured are scarcely different from the true *dilophus* of the north, being rather larger than typical Florida specimens. These latter, however, vary considerably in size among themselves.

14. *Pelecanus occidentalis* (Linn.). BROWN PELICAN.—Although Brown Pelicans are said to breed abundantly on some of the Bahama

Islands, we saw but few throughout our trip among the northern islands. Two were observed on July 6, among the Marls of Great Abaco, and again, on July 11, we sailed up very near to a single bird as it sat sedately on one of the small rocky islets of the Pensacola Cays.

15. *Fregata aquila* (Linn.). MAN-O'-WAR BIRD.—These birds are common throughout the islands but we found no nests and rarely saw many together save at their roosts. Two large roosts were visited. One of these, at Great Abaco, was a large isolated clump of mangroves rising from the shallow waters of the "bight" to the south of Marsh Harbor. Thither the birds began to repair some hours before sunset, but evidently did not settle down till towards nightfall. As we passed this roost, locally known as "Man-o'-war Bush," at about daybreak of July 6, some fifty or more birds flew off and scattered in all directions. The other roost mentioned was at Fish Cays, Great Abaco. Some of our crew visited this roost after dark on July 5, and captured ten birds alive among the big mangroves. These were of both sexes, and two which we kept alive aboard our schooner became fairly tame. Though they had the liberty of the ship, they seemed unwilling or unable to fly away, but perched contentedly on the anchor chains or about the capstan, and ate greedily of the fresh fish we gave them. They were rather ill-tempered, however, and were quick to take offence if crowded or jostled. With their sharp beaks they would lay hold of passers-by or of one another, and could inflict a considerable wound. One of the birds eventually perished, but the other stayed by us throughout most of our trip. When finally we reached Great Abaco on our return voyage, we tossed him into the air, and he shook himself together with a curious motion and sailed away out of sight.

16. *Poecilonetta bahamensis* (Linn.). BAHAMA DUCK.—On the south side of Great Abaco, stretching for many miles east and west, is a tide-water region locally known as "the Marls." Long reaches of shallow water alternate with clayey flats a few inches above tide level. These flats are thinly covered with a growth of small mangroves, grasses, and a few other halophytes while here and there are little pools surrounded by taller mangrove bushes. In this sort of country we found a good number of these handsome ducks. Most of those seen were in pairs, but one flock of fifteen birds was started from a small pond among the mangroves, July 6. Cory found them breeding at Andros about the last of May.

17. *Phœnicopterus ruber* (Linn.). FLAMINGO; "FILLYMINGO."—Mr. Bonhote¹ states that he was unable to ascertain certainly whether the Flamingo still exists on Great Abaco, but we were more fortunate. So far as we could learn from exploration and inquiry there is but a single colony of these gorgeous birds among the northern Bahamas. This colony inhabits the great "Marls" of Abaco, but for the past two years

¹ Bonhote: *Ibis*, Ser. 8, Vol. III, 1903, p. 310.

none of the natives had been able to locate the nesting site. Mr. Barbour and the writer spent July 5 and 6 with two guides sailing among the intricate waterways of the "Marls" and were fortunate in finding one flock of 54 birds. They were very shy, however, and would not allow us to approach within gunshot. Most of them seemed to be old birds and they presented a brilliant sight standing in the water against a background of green. This apparently is the most northerly breeding colony on this coast. They are subject to constant persecution by the natives who esteem their flesh as preferable to that of the gaunt chickens of the Bahamas. The negroes believe that the birds possess a keen scent and in hunting them, try to approach from the leeward. Others approach from the windward as the birds must rise into the wind and hence come toward the hunter for a distance before swinging off. We purchased a male wing-tipped bird of some boys who had hunted this same flock on the day before our visit. He soon became very tame and greatly amused us with his ludicrous ways. "Filly," as he was dubbed by the crew, would stand all day in his feed-pan that contained a thin mixture of meal and water. We did not discover that he fed much in the daylight hours, but apparently he spent a large part of the night dabbling and sputtering in his meal. One of the crew aptly compared the continuous sound produced to that of a little waterfall. If approached or handled he would make feints at biting, at the same time uttering very duck-like *quacks*, but there seemed to be little power in his mandibles, for his bites were quite harmless. When angry he had an odd way of lowering his head well below the level of the body, at the same time bending his long neck into a sigmoid curve. We were finally obliged to chloroform the bird, and eventually ate the meat which was not unlike that of a fowl. The fleshy tongue is considered a particular delicacy.

18. *Ajaia ajaia* (Linn.). ROSEATE SPOONBILL.—A single Spoonbill was seen July 6, on the Marls of Great Abaco, by Messrs. Barbour and Bryant.

19. *Dichromanassa rufescens* (Gmel.). REDDISH EGRET; "WHITE ARSNICKER."—Several times we saw what were undoubtedly examples of this species, but all were in the white phase. In early July we saw a few on the Marls of Great Abaco, and a single bird on July 19 on the tide-water flats of Great Bahama. In all cases they were very wary and flew off long before we could approach within gunshot.

20. *Hydranassa tricolor ruficollis* (Gosse). LOUISIANA HERON; "POOR JOE."—This was perhaps the commonest heron we observed. A few were usually to be found about the mangrove swamps and one large rookery was visited July 7, on Great Abaco, where a number of young birds were seen about ready to leave their nests.

21. *Butorides bahamensis* (Brewster). BAHAMA GREEN HERON; "BITTERN" or "BITLIN."—Single birds were seen on most of the larger islands visited, including New Providence. On many of the cays they were also found among the mangroves. Specimens were taken which

seemed to be young of the year, and we found no signs that any birds were still breeding. On New Providence the expressive name "Poor Joe" is applied to this bird though elsewhere that term was reserved for the Louisiana Heron.

22. *Nyctanassa violacea* (Linn.). YELLOW-CROWNED NIGHT HERON; "GAULIN."—Although of general distribution among the northern Bahamas, we did not find this a common species. They breed early, and apparently were done nesting at the time of our visit.

23. *Rallus coryi* Maynard. CORY'S RAIL; "MARSH HEN."—A single specimen in very worn plumage was taken on the Marls of Great Abaco, July 6. We came upon the bird as we were making our way through a growth of small mangroves, where it stood tamely, watching our movements.

24. *Actodromas minutilla* (Vieill.). LEAST SANDPIPER.—A single female bird, doubtless one of the advance guard of the fall migrants, was taken at Great Bahama, on July 18.

25. *Totanus melanoleucus* (Gmel.). GREATER YELLOW-LEGS.—On the Great Abaco Marls we came upon one of these birds feeding about the edge of a small pool among the mangroves. The date, July 6, seems so early as to render it unlikely that the bird was a newly arrived migrant from the north.

26. *Symphemia semipalmata* (Gmel.). WILLET; "PILLY-WILLICK."—Among the salt water marshes grown up to small mangroves and other bushes, and particularly among the Marls of Great Abaco, Willets were everywhere common. More often we saw them in pairs and their actions betokened that they were still breeding. One of our guides at Great Abaco said he found a nest containing four eggs on the Marls, July 6. We also obtained a fully grown bird of the year on July 18 at Great Bahama. Their habit of perching on the low bushes was frequently noted, and at such times they often uttered a sharp and plaintive cry of a single note. When startled, they fly about in an aimless sort of way up and down the marshes, now approaching, now swinging away from the observer, all the while uttering their loud "pill-will-willet." After comparing our series of skins with birds from the northern parts of America, we are unable to discover any constant or tangible differences.

27. *Ochthodromus wilsonius* (Ord). WILSON'S PLOVER; "SNIPE."—This was the only plover observed among the northern islands, and almost every sandy beach or mudflat had a pair or two of them. In many cases young birds but a few days from the egg were noticed running about at the water's edge or seeking shelter among the rocks and grass while the parent bird with loud cries endeavored to lead us away by feigning a broken wing or a crippled leg.

28. *Colinus bahamensis* Maynard. NEW PROVIDENCE BOB-WHITE.—A few were heard calling in the open pine barrens back of Nassau on July 26.

29. *Columba leucocephala* Linn. WHITE-CROWNED PIGEON; "PI-

GEON."—According to Cory, these handsome pigeons are rarely seen in the winter on account of their frequenting the thickly wooded parts of the islands, but "as soon as the summer season sets in they become gregarious, and repair in immense flocks to the outer keys to breed Incubation commences about May 1." Green Cay, to the south of New Providence, is a famous nesting place. We found one large breeding colony on Moraine Cay, July 12-14, where hundreds of birds must have been nesting. The nests were built in the dense growth of bushes and vines, usually at from 4 to 6 feet from the ground. Many contained the complement of two eggs, others held young squabs, and some had one egg and one young bird. During much of the day many of the birds seemed to be absent and could be observed in the early morning leaving in small flocks for their feeding grounds on neighboring islands, but towards evening they returned, and we obtained a number of the incoming birds for our table. Practically all of a number thus obtained were males, whose crops were filled with small purple berries. At Great Abaco many birds came nightly to roost among certain large isolated clumps of mangroves growing in the shallow waters of the "bight" on the south side of the island. They would fly in at just about sunset, and we were told that later in the season they resorted to these roosts in large numbers. A great many are killed for the local markets by gunners who conceal themselves in these clumps and shoot the incoming birds. Those which we found during the first week of July at these mangroves must have finished breeding.

30. *Zenaida zenaida* (Bonap.). ZENAIDA DOVE; "WOOD DOVE."—This dove was apparently uncommon among the islands visited. Two or three individuals were seen at Stranger Cay, July 15-16, and about as many more among the large colony of breeding White-crowned Pigeons at Moraine Cay. All those seen were single birds and were quite tame in contrast to the pigeons, which were very wary.

31. *Columbigallina passerina bahamensis* (Maynard). BAHAMA GROUND DOVE: "TOBACCO DOVE."—On all the islands that had any considerable growth of trees and bushes this little dove was found to be generally distributed. Of the outer cays visited, a few were found on Elbow Cay, Great Guana Cay, Moraine Cay, Stranger Cay, and Great Sale Cay. At Elbow Cay, July 4, I came upon one of these birds about noon, sitting on her nest which contained neither eggs nor young. The nest was a loosely made platform of twigs and grass placed in the crotch of a small tree some ten feet from the ground. Clearings and cultivated fields, or the edges of woods are the favorite haunts of these doves, and much of their time is spent feeding on the ground.

32. *Cathartes aura* (Linn.). TURKEY VULTURE.—Buzzards were seen on the larger islands only of the northern group—Great Abaco, Little Abaco, Great Bahama, and Elbow Cay. At Little Abaco they were seen more numerous than elsewhere as they had been attracted by the remains of a recently slaughtered sheep. They appear to be quite absent

from the smaller uninhabited islands and cays. Curiously enough, also, they are unknown on New Providence, notwithstanding that it is more thickly settled than the other islands. Dr. Henry Bryant, in 1859, attributed this absence from the vicinity of Nassau to an inability to procure food, as "all the animals slaughtered there are literally devoured by the blacks." To the present writer, however, the voracity of the blacks seems hardly a sufficient explanation of this curious distribution. Northrop¹ found them "very common on Andros," but his statement that "more were seen on New Providence" is evidently a misprint for "none were seen on New Providence."

33. ?*Falco* sp.—At Great Abaco, on July 21, a small falcon, hovering after the manner of a Sparrow Hawk was seen for several moments, but so far away as to make identification impossible. At Nassau, we also saw what was undoubtedly a Sparrow Hawk, on June 29. It flew past at close range, so that its colors were fairly distinguishable.

We saw nothing of the Bahama Osprey nor of the resident Red-tailed Hawk during our entire trip.

34. *Strix pratincola* Bonap. AMERICAN BARN OWL.—At Hurricane Hole, Great Abaco, a single bird was started from a large open cave by the shore.

35. *Amazona bahamensis* (Bryant). BAHAMA PARROT.—We were interested to learn through the captain of our schooner, that a few parrots still exist on Great Abaco. He told us of having seen a flock near Marsh Harbor the year before (1903) and in previous years had sometimes observed a flock in late summer at that part of the island. We learned that at Acklin's Island, about 140 miles south of Nassau, parrots still nest in numbers and the young birds are regularly taken from the nest when fledged, and brought to Nassau to be sold as pets. Mr. Robert Johnstone, the Colonial Magistrate at Nassau, showed us a handsome bird which he had obtained in this way. It was very tame and docile, and frequently was allowed the liberty of the yard.

36. *Crotophaga ani* Linn. ANI; "JACKDAW"; "LONG-TAILED CROW."—On the larger islands Anis are not uncommon, and are usually found in the vicinity of cultivated lands and gardens. Yet they keep well out of sight and we saw but few at Nassau and vicinity. A small flock was seen at Elbow Cay, July 4, near a cocoanut grove, and at Little Abaco we were shown a nest with five eggs taken there shortly before our visit.

Of other members of the Cuculidæ we saw nothing though once or twice some cuckoo-like notes were heard but could not be identified.

37. *Dryobates villosus piger*,² subsp. nov.

Type.—Male, adult, No. 40207, collection of the Museum of Compara-

¹ Northrop : Auk, Vol. VIII, 1891, p. 76.

² *piger*, indolent, slow.

tive Zoölogy, Cambridge, Mass. Collected at Great Bahama Island, July 17, 1904, by Thomas Barbour and Glover M. Allen.

Subspecific characters.—A black spot on the inner web near the tip of each of the two outer pairs of tail feathers; the black stripe on the breast at each side is narrower and terminates less abruptly than in *D. v. auduboni* but is not continued as a series of streaks as it is in *D. v. maynardi*.

Description.—Adult male: crown, scapulars, upper tail coverts, a stripe behind the eye, and another below it from base of beak to neck and continued along side of upper breast, black. A white stripe above and one below the eye, united in front at base of bill, and often forming a ring which encircles the eye; a tuft of bristly feathers covering nostrils, and sometimes a few small feathers at base of upper mandible, white. Throat, breast, abdomen and under tail-coverts white, the body feathers with plumbeous bases; a white median stripe on the back. Wings brownish black with numerous rounded white spots. A red transverse occipital patch, which may show a tendency to a division into two lateral patches as in *D. v. auduboni*. The first outer pair of tail feathers white with a small amount of black at base of inner vane, and a *black spot about 1 cm. from tip on margin of inner vane*; second pair of tail feathers similar but with the black at the base extending up for $\frac{2}{3}$ the length of the inner vane and for a less amount on the outer vane of each, *the terminal black spot usually larger than on first pair*; third pair of tail feathers black save for a small subterminal patch of white mainly on the outer web; central pair of tail feathers entirely black.

Adult female similar but without the red occipital patch.

Size.—Smaller than *D. v. auduboni* of the mainland, but equalling *D. v. maynardi* of the more southern Bahamas. Wing: average of 5 specimens, 102 mm., as against an average of 112 mm., for 9 specimens of *D. v. auduboni*.

Specimens examined: Great Bahama, 2 (in collection of Mus. Comp. Zoöl.); Abaco, 5 (in collection of U. S. Nat. Mus.).

Remarks.—This race is more nearly related to *D. v. maynardi* than to the continental *D. v. auduboni*. Hairy Woodpeckers, in any considerable series, show more or less variation in the markings. In the series of 7 skins from the northern Bahamas, however, all save one have a well marked spot on the inner side of the first two pairs of tail feathers. The exception, a young ♀, No 108615, collection U. S. National Museum, from Abaco, shows a very small black spot on the inner web of the right outer tail feather only and none at all on the feathers of the second pair. In none of the 11 adult topotypes of *D. v. maynardi* in the Bangs collection, and that of the American Museum of Natural History, is there any trace of these black spots on either of the outer two pairs of tail feathers. Among the larger, continental Hairy Woodpeckers these spots rarely occur, but in one specimen in the collection of Mr. William Brewster they are in the nature of transverse bands such as are present normally in the case of the Downy Woodpecker.

In the Northern Bahama and the Maynard's Hairy Woodpeckers is seen a progressive reduction in the amount and extent of the black in the side stripe or epaulette, so that from a large, triangular patch with sharply defined borders in *D. v. auduboni* it becomes in *D. v. piger* a band with a less clear-cut limit posteriorly while in *D. v. maynardi* the band becomes finally reduced to a series of streaks at its posterior extension. This is due to the restriction of black in the terminal feathers of the stripe, so that while in *D. v. piger* most of these feathers are entirely or largely black, in *D. v. maynardi* the black is limited to a median streak. One of the New Providence specimens of *D. v. maynardi* (a fine adult female) has the breast stripe practically as in the Northern Bahama bird, but in all the other skins examined the difference is usually apparent at a glance.

Through the courtesy of the American Museum of Natural History, I have been able to examine four birds from Andros. These as expected, are quite typical of *D. v. maynardi*, and have unspotted tips to the outer two pairs of tail feathers, except that one specimen (an immature male) approaches the Northern Bahama bird in having a minute black spot on the inner web of the right outer tail feather and another on the left tail feather of the second pair.

We did not find this bird except among the open pine woods of Abaco and Great Bahama, where it apparently is generally distributed but not very common. Its movements impressed me as being slow and lethargic as compared with the energetic jerks and resounding thwacks of our New England Hairy Woodpecker. The notes were similar to those of our bird. All the specimens had the breast feathers stained a dull reddish from the pine bark.

38. *Centurus blakei* (Ridgw.). BLAKE'S WOODPECKER. — Near Sweeting's Village, Great Abaco, we found several of these woodpeckers on July 21, among the trees which here form a fairly respectable forest. One pair was accompanied by several fully grown young, which, however, were still being fed by the old birds. Their loud, tree toad-like rattle was very similar to that of our Red-headed Woodpecker. According to the natives these woodpeckers were almost always to be found in this particular vicinity, and, indeed, we did not meet with them elsewhere.

39. *Chordeiles virginianus vicinus* Riley. BAHAMA NIGHTHAWK; "KILLY-KA-DICK." — We found the newly-described Bahama Nighthawk common on most of the islands visited. At Nassau numbers of them were flying, towards sunset, and elsewhere we sometimes observed them at other hours of the day hawking after insects. On many of the outer cays they were almost always found in the strip of grass and scattered bushes just back of the beach, and on Moraine Cay we started several pairs from such cover in a walk of half a mile or less. When flushed they usually alighted again a short distance away. Their color harmonized well with that of their surroundings. On Moraine Cay a specimen

was taken whose plumage was unusually light because of a partially albinistic tendency. The four-syllabled note of the bird has gained for it its local name, rendered throughout the northern islands as "Killy-ka-dick." This note has the same penetrating quality as that of our northern bird, and oftentimes is heard apparently close at hand while the bird itself is a distant speck against the sky. We found them common at Great Bahama as well as on most of the cays.

40. *Riccordia æneoviridis* Palmer & Riley. BRONZY RICCORDIA.—This hummingbird occurs commonly with the following species on the "main" islands, Great Abaco, Little Abaco, and Great Bahama and also on all the outer cays wherever there is any considerable growth of bushes. On Great Bahama both species of hummingbirds were numerous, frequenting the bushy undergrowth in the open pine woods. On the larger cays we usually found them among the low bushes on the edges of open spaces, and often heard their squeaking notes as they darted past in playful pursuit of one another. On only one occasion did we see them off the islands. This was on July 4, when a bird flew past our schooner close to the water, crossing the bay at Elbow Cay off the Hopetown harbor. Its flight over sea was hardly less than a mile but the water was perfectly calm.

41. *Doricha evelynæ* (Bourc.). BAHAMA WOODSTAR.—On all the islands and cays wherever there was bush or tree growth this hummingbird occurred. Both species were especially numerous in the undergrowth of the Great Bahama pine woods. Curiously enough, this species does not seem to have been reported heretofore from Great Bahama though we found it there during our visit on July 17-18, and also on Elbow Cay, Moraine Cay, Stranger Cay, and at Nassau, New Providence.

42. *Tyrannus dominicensis* (Gmel.). GRAY KINGBIRD; "PICK-PETER."—This was one of the most conspicuous of the land birds and nesting pairs were found on all the islands and larger cays wherever there was a growth of tall bushes or trees. They prefer the vicinity of the water and even frequent the usually barren mangrove swamps, nesting along their edges. Nests with fresh eggs were found at Elbow Cay on July 5; these were usually placed in a crotch some ten feet from the ground or overhanging the water. The sharp notes of the birds were not unlike the words "Pick-Peter," whence the local name.

43. *Myiarchus leucaysiensis* Bryant. RUFOUS-TAILED FLYCATCHER.—A pair only of these birds was seen at Cedar Harbor, Little Abaco, July 11. They were silent and kept near together along the bushes fringing a limestone bluff by the sea.

44. *Blacicus bahamensis* (Bryant). LEAST BAHAMA FLYCATCHER.—Among the open pine woods to the south of the city of Nassau, New Providence, we found two individuals of this little flycatcher, July 26. Their habits were somewhat like those of our Wood Pewee. They perched among the higher branches of the pines whence they occasionally darted after passing insects, and returned again to the same or a nearby

branch. They were rather lethargic in their motions and maintained an absolute silence. We did not meet with this bird elsewhere.

45. *Agelaius phoeniceus bryanti* Ridgw. BAHAMA REDWING; "RICE-BIRD." — This is a common and characteristic bird of the larger islands wherever there are marshes and in the bushy growth along the shores of these islands and the cays. It is one of the few birds found among the mangrove swamps. They were very tame at all times and the males would sing fearlessly but a few feet from the observer. The breeding season seemed to be practically over by the first week of July, and we frequently found small family flocks consisting of the pair of old birds with their fully grown young. The song differs from that of our northern bird not only in its thin and scraping quality, but also in the addition of a note at the end of the bar, thus: *kon-ki-rele-ah* with a slight rising inflection.

46. *Icterus northropi* Allen. NORTHROP'S ORIOLE; "COCOANUT BIRD." — At Andros, Mr. Bryant obtained a single immature specimen near Mangrove Cay, in early August. We were also told by Mr. Meeres, of the Sisal Fiber Co., that he had taken a specimen of this rare oriole on Little Abaco early in July, 1904.

47. *Pyrrhulagra violacea* (Linn.). PURPLE GROSBEEK. — We saw a few scattered flocks of this species on New Providence and Great Abaco, but did not meet with it elsewhere although it is known from the other larger islands. It appears to be quite absent from the cays.

48. *Tiaris bicolor* (Linn.). BAHAMA GRASSQUIT; "PARAKEET." — Everywhere among the islands this was an abundant species. Most of the old birds taken were in very worn breeding plumage and the nesting period seemed to be passed. Nevertheless male birds were in full song throughout July. Many of the birds seemed to be settled in certain localities where they were almost always to be found. They feed largely on the ground or among the low bushes, but at intervals a male will fly up to the top of a bush or sisal stalk and burst into song after which he presently returns to the ground again. At Nassau a male that frequented the hotel gardens usually flew to a telegraph wire stretched across at some twenty feet above the ground, when he wished to sing, but usually a more humble perch is chosen. We frequently saw small family parties of adult birds and fully grown young by the roadside, in thickets and open fields, or even about the houses. They were common in nearly all situations on the larger islands and were certain to be met with on all the outer cays in the less dense bushy growth. At Little Abaco, while visiting Mr. A. H. Nield of the Sisal Fiber Co., we were interested to observe the fearlessness of these little finches. They flew in at the open windows, and regularly visited the dining room at meal times for crumbs, or perched at arm's length from us on the piazza railing to sing.

49. *Spindalis zena* (Linn.). BLACK-BACKED SPINDALIS; "BANANA BIRD"; "COCK ROBIN." — At New Providence this was a common species, frequenting the edges of woods near cleared ground. Several

times we saw what seemed to be scattered flocks feeding on the ground or among the bushes, and on July 26th we heard several of them singing softly among the open pine woods. Mr. Bryant also secured a specimen at Andros. It has less white in the outer tail feathers than our New Providence specimen.

50. *Spindalis zena townsendi* Ridgway. TOWNSEND'S SPINDALIS.—This race is characteristic of the large islands of the northern Bahamas, and is strikingly different from the more southern *zena* by reason of its olive-green back. So far as at present known, it is found only on Great Abaco (type locality), Little Abaco, and Great Bahama. The only examples we met with were two specimens taken at Great Bahama among the thick undergrowth of the pine woods. The cays seem not to offer any attractions for this bird.

51. *Vireo calidris barbatulus* (Cab.). BLACK-WHISKERED VIREO.—This vireo is a bird of the more open tree growth, particularly in the neighborhood of cultivated lands. We met with it not infrequently on New Providence and Abaco, but saw none on Great Bahama, from which island it has not yet been reported. Its absence there is doubtless due to a lack of suitable tree growth, at least in the portions hitherto visited. The extensive pine forests seem to be wholly avoided by it. The song is somewhat similar to that of the Red-eyed Vireo, but less varied, almost a monotone, delivered in a quiet apathetic way from some hidden perch. On Elbow Cay, July 4, we found a nest of this bird swung from the slender fork of a small tree at some six feet from the ground. The nest contained a single egg of the usual vireo type, and appeared to be quite fresh. We also found this species on several of the larger cays where there were tall bushes, as at Stranger Cay.

52. *Vireo crassirostris* (Bryant). THICK-BILLED VIREO.—This species was the more conspicuous of the two vireos observed and was found on all the large islands and on most of the cays of any size. Its explosive little song was heard frequently during most of July and at times I was able to observe the singer sitting quite motionless on some small branch usually but a few feet from the ground. On the outer cays a few pairs were found here and there in the dense tangled growth of vines and small bushes which the Black-whiskered species generally avoids. We saw no nests, but full grown young were not uncommon. This species was noticeably tamer than the Black-whiskered, and it was a simple matter to approach a singing bird very closely for the cracking of twigs or stirring of branches seemed not to alarm it in the least.

53. *Callichelidon cyaneoviridis* (Bryant). BAHAMA SWALLOW.—At Nassau there was a small colony of these swallows about the Colonial Hotel. A few were to be seen at almost all hours of the day flying about the eaves or resting on the shelf-like cornice. We were unable to discover if the birds were breeding, but they seemed to use the hotel as a rendezvous. At Hurricane Hole, Great Abaco, on July 22, a flock of a dozen or more was watched for a while, flying back and forth about the

mouth of a large open cavern among whose upper ledges there may have been nests though no birds were seen to alight. A single swallow was also observed flying about on the edge of the pine woods at Great Bahama.

54. *Cœreba bahamensis* (Reich.). BAHAMA HONEY CREEPER; "YELLOWBREAST."—This is one of the commonest and most characteristic of the Bahaman land birds, and was found on every island and cay where there was tree or bush growth. Few or none occur in the mangroves, however. At New Providence in early July, we occasionally heard the peculiar wirey song of the Honey Creeper which has somewhat the quality of the Ruby-crowned Kinglet's intricate melody with a peculiar far-away and ethereal softness. Most of the birds were through nesting at the time of our visit and we found numbers of abandoned nests. These were usually from four to six feet from the ground, in the fork of a small bush, globular, with the entrance near the top at one side. A nest containing four partly incubated eggs was found July 4, at Elbow Cay. Everywhere on the islands, among the bushes and thickets were little groups of these birds, old and young. They were exceedingly tame and eyed us curiously, often but arm's length away. At Great Bahama we found them as abundant as elsewhere yet the species is almost unknown on the Florida coast only 60 miles distant. A partial albino was taken at Elbow Cay, July 5. The yellow patches were present as in normal specimens but the rest of the plumage was whitish.

55. *Dendroica petechia flaviceps* Chapman. BAHAMA YELLOW WARBLER.—This was nowhere a common bird though we found it among the large mangrove swamps in several localities as at Great Abaco, Moraine Cay, and Great Sale Cay. On July 4, at Elbow Cay, an adult male accompanied by two full grown young in immature plumage, was observed among some bushes not far from a small swamp. The bright song of the old bird somewhat resembled that of our *Dendroica aestiva*. On a few other occasions we observed singing birds; and while among the Great Abaco Marls we found several young birds of the year and one or two singing adults in a large mangrove "bush" or island, July 6.

56. *Dendroica dominica* (Linn.). YELLOW-THROATED WARBLER.—A single specimen was obtained at Mangrove Cay, Andros, by Mr. Owen Bryant on August 2. Another was also seen at Nassau by Mr. Bryant on August 7. Doubtless these were early migrants.

57. *Dendroica pityophila bahamensis* Cory. BAHAMA WARBLER.—So far as known this species is confined to the large islands of the northern Bahamas where it lives among the pines. We found a few at Great Bahama, and one immature bird taken there July 17, was just beginning to acquire the yellow breast and crown feathers. These are active, restless little birds and live well up among the branches of the slender pine trees. Several times we heard the short rich song during the afternoon of July 17.

58. *Dendroica vigorsii achrustera* (Bangs). NEW PROVIDENCE PINE WARBLER.—This very distinct race is common on New Providence Island among the open pine woods, and we found birds in song during our stay there in early and late July. On July 26 an adult female was watched for some time as she waited upon one of her fully grown young. The latter was restless and during the intervals when its parent was absent in search of food, would fly here and there among the trees keeping up a constant chipping characteristic of many young warblers, in order that its parent might find it when she arrived with food.

59. *Dendroica vigorsii abacoensis* Ridgway. ABACO PINE WARBLER.—Several specimens were obtained at Great Bahama, July 17 and 18, 1904, and these agree precisely with Ridgway's description of the Abaco bird. There can be no doubt that this is the form characteristic of the large islands of the northern group of the Bahamas. Since it frequents the open pine woods only, its range is restricted to the islands of Great Abaco, Little Abaco, and Great Bahama, where these trees grow. The habits and song of both these subspecies seemed indistinguishable from those of our Pine Warbler of the northern United States.

60. *Geothlypis tanneri* Ridgway. TANNER'S YELLOWTHROAT.—Unfortunately our collections do not throw very much light on the somewhat complicated problem of the geographical relationships of the various Bahama Yellowthroats. We were unsuccessful in finding the genus at all on New Providence, and after careful search among the islands of the northern group found only the species *tanneri*. This is common in bushy growths both on the "main" islands and on several of the larger cays. At Great Bahama a number of individuals were found both in the swamps along shore and among the bushes in the dry pine woods. All the specimens obtained are typical *tanneri*. The adult males still retained (July 18) their black cheek-patches, though the breeding season was about over. Specimens were taken on Great Bahama and Moraine Cay, and birds were also observed in full song on Abaco and Elbow Cay. At Moraine Cay, July 14, an adult male was seen feeding a full grown young bird which followed its parent closely, begging for food. The species *incompta* described by Ridgway from two Abaco specimens taken early in April, 1886, seems to represent the group of Yellowthroats with light abdomens. If it is actually resident among the northern Bahamas it is odd that we did not find it.

61. *Mimus gundlachi* (Cab.). BAHAMA MOCKINGBIRD.—On the outer cays where there is an abundance of thick bushes and tangled creepers this Mockingbird is not uncommon, although we found it rather shy and retiring. None were seen on any of the large islands, although Mr. Bonhote has found them in winter on New Providence and Little Abaco. At the time of our visit they seemed to be about through breeding, though some were seen tending fully grown young. Thus on Moraine Cay, July 13, an adult male was seen hopping quickly about on the ground among the undergrowth closely followed by two young birds whom he fed from time to time. The latter kept up all the while a fine sibilant

note which I at first mistook for the chirp of a grasshopper. On one or two occasions we heard the song of this Mockingbird, but most of them seemed to have stopped singing. We saw birds on Stranger Cay, Moraine Cay, and Great Sale Cay.

62. *Mimus polyglottos* (Linn.). MOCKINGBIRD.—As noted by Bonhote,¹ the White-winged Mockingbird of the northern Bahamas appears to be the same as the bird of the neighboring mainland. It seems to have come in within a recent period and keeps close to the villages and settlements. We found it commonly about the edges of clearings and cultivated ground at Elbow Cay, and discovered nests with fresh eggs at that place on July 4 and 5. Bonhote records the bird also from Great Abaco, as well as nests and eggs in March from Little Abaco. At the extensive sisal plantations on the latter island we saw numbers of the birds, particularly near the houses, and were told by Mr. Meeres, of the Sisal Fiber Company, that they had noticeably increased during the past few years. Many of the Mockingbirds were still in song, and I several times heard them at various hours of the night during the full moon of early July.

63. *Polioptila cærulea cæsiogaster* Ridgway. BAHAMA GNATCATCHER; "CATBIRD."—We met with this bird only twice among the northern islands, once on Elbow Cay, July 4, and again, July 17, a few were found at Great Bahama among the bushy growth of the pine woods.

64. *Mimocichla plumbea* (Linn.). PLUMBEOUS MOCKINGBIRD; "BLUE THRASHER."—Only two specimens of this bird were seen throughout our trip, one at Cedar Harbor, Little Abaco, on July 11, and a second near Sweeting's Village, Great Abaco, July 22. They were not shy but their manner of life among the thickets and their silence at this season of the year rendered them difficult to observe.

By way of summary it is interesting to group together the species of birds that inhabit the different sorts of country. Thus the following 20 species and subspecies occur chiefly if not exclusively on the larger "main" islands, as New Providence, the Abacos, and Great Bahama:

Pæcilonetta bahamensis.

Phænicopterus ruber.

Colinus bahamensis (New Providence).

Cathartes aura (except New Providence).

Amazona bahamensis (Great Abaco).

Crotophaga ani.

Dryobates villosus maynardi and *D. v. piger.*

Centurus blakei.

Myiarchus lencaysiensis.

¹ Bonhote: Ibis, Ser 8, Vol. III, 1903, p. 276.

Blacicus bahamensis.

Icterus northropi.

Pyrrhulagra violacea.

Spindalis zena zena and *S. z. townsendi.*

Dendroica pityophila bahamensis.

Dendroica vigorsii achrustera and *D. v. abacoensis.*

Mimus polyglottos.

Mimocichla plumbea.

Of these, the Hairy Woodpeckers, Least Bahama Flycatcher, Bahama Warbler, and Pine Warblers we found in the pine growth only.

A few species, some 15 land birds, we found not only on the larger islands with their more varied growth, but also on the smaller and rather barren outer cays. These are mainly such birds as frequent thick bushes or the mangrove swamps. Those that we noted are the following: —

Columba leucocephala.

Zenaidura macroura.

Columbigallina passerina bahamensis.

Chordeiles virginianus vicinus.

Riccordia aeneoviridis.

Doricha evelynæ.

Tyrannus dominicensis.

Agelaius phœniceus bryanti.

Tiaris bicolor.

Vireo calidris barbatulus (rarely).

Vireo crassirostris.

Cœreba bahamensis.

Dendroica petechia flaviceps.

Geothlypis tanner.

Mimus gundlachi.

These small cays apparently have no land birds peculiar to themselves.

The birds of the mangrove swamps are few. Cormorants and several of the Herons nest among their branches, and the Mangrove Warbler (*Dendroica petechia flaviceps*) is practically confined to them as far as we could observe. But otherwise they offer little attraction from an ornithological standpoint, and are quite barren and deserted save for a few Gray Kingbirds and Bahama Redwings that nest on their borders.

In conclusion I wish to express my thanks to Mr. Outram Bangs for his aid in identifying many of the specimens, and to the authorities of the American Museum of Natural History and of the United States National Museum for the loan of specimens for comparison. The greater part of the birds that we collected have been presented to the Museum of Comparative Zoölogy, at Cambridge, and the remainder have been added to Mr. Outram Bangs's collection of West Indian birds.

THE MIGRATIONS OF CERTAIN SHORE BIRDS.

BY AUSTIN H. CLARK.

THE object of this paper is to explain, in as brief terms as possible, what I consider is the main factor by which many of our shore birds are guided in their migrations. I refer especially to those species which pass southward over the western Atlantic, from the eastern Canadian Provinces, past the Bermudas and the easternmost of the West Indies to South America, as far south as Patagonia, and return by way of Central America and the Mississippi Valley. The bird which I have chosen as the best representative of this class, and with which I shall mainly deal, is the Golden Plover (*Charadrius dominicus*), as it is large, well known, easily identified (even when passing over at night), and does not occur commonly, as do many other species (for instance the Spotted Sandpiper, *Actitis macularius*, the Turnstone, *Arenaria interpres*, and the Yellow-legs *Totanus flavipes*), in the southern part of its range at all seasons.

Briefly summarized, the route taken by this plover in its migrations (*vide* Cooke, Yearb. Dept. Agriculture, 1903, p. 371) is as follows: — Starting from the breeding grounds in western Arctic America, it goes to Labrador (arriving in August) where it fattens on the 'curlew berries' which are ripe at that time, and then travels southward, leaving the continent at Nova Scotia, over the sea past (sometimes four hundred miles or more east of) the Bermudas, then just east of and over the Lesser Antilles, reaching South America at the Guianas and the northernmost coast of Brazil (about the first of September). It soon disappears, but reappears again on the prairies of Argentina, and goes as far south as Patagonia, where it remains from September to March. In March it appears in northwestern Colombia, Panama, and Central America, passes up the Mississippi Valley, reaches the prairie regions of the United States in April, crosses into Canada in May, and is back on its breeding grounds in June.

The question naturally arises, why do the birds come north by a different route from that taken going south, and what guides them in their long sea journey from eastern Canada over the Atlantic to the Guianas?

As long ago as 1848, Sir Robert H. Schomburgk made the interesting observation (Hist. Barbados, p. 681) that these plover, in common with other shore birds, when flying over the island of Barbados (the most easterly of the West Indies) take a course from northwest to southeast, at right angles to the direction of the wind (the northeast trade). Col. H. W. Feilden, in writing of the birds of Barbados (Ibis, 1889, p. 490; West Indian Bulletin, III [1902], p. 343), also notes this fact adding that "it appears to be a well established observation that birds prefer migrating with a 'beam' wind." When in Barbados in September, 1901, I was told by several sportsmen that the shore birds were always seen to pass the island flying from northwest to southeast, and I observed the fact myself in the migration seasons of 1903 and 1904.

Thus it appears that within the trade-wind belt, at least, these birds always direct their flight in a definite relation to the direction of the wind. With us, living in the north temperate zone, the winds are so irregular and variable that we can hardly form any accurate idea of the regularity of the winds within the tropics, and to a lesser extent, over the sea in general, unless we have had more or less experience with them.

Acting upon the supposition that the invariable relation of the flight of the Golden Plover to the direction of the wind when in the West Indies might be in reality a key to the course taken by them during the major part, if not the entire extent of their flight, I have mapped out a theoretical course which the birds would follow, provided they depended on the direction of the wind as a guide, and flew always at right angles to it.

There is one important point to be borne in mind in connection with this, and that is that a bird flying directly across a wind will be carried to leeward out of the course it appears to be taking just as many miles every hour as the force of the wind is miles per hour. I may illustrate what I mean by a parallel case. If a man were to row a boat at the rate of four miles an hour across a stream with a current of two miles an hour, which (let us assume) it takes him an hour to cross, if he rows always with the axis of the boat at right angles to the force of the current, he will reach the other bank at a point as far down stream from a position exactly

opposite the place from which he started, as the current of the stream will have gone on during the time he took in crossing. In the case given, he would be two miles below the position opposite the starting point, as the stream had a current of two miles per hour, and he took an hour to get across. In the same way, assuming the flight of Golden Plover to be one hundred miles an hour, and the strength of the wind which it is crossing to be thirty miles an hour, in one hour's flight, the plover would have reached a point one hundred miles from where it started, but thirty miles to the leeward of a line drawn from the starting place at right angles to the wind. Thus in calculating the course which would be taken by birds, provided they relied on the wind for a guide and flew at right angles to it, we must remember that the direction taken is in reality more or less diagonally across it (depending on the strength of the wind) although the birds are all heading directly across it.

Starting from their breeding grounds in western Arctic America, the course of the Golden Plover would be southeasterly across the prevailing southwest winds, which would bring the birds across north central and northeastern Canada to Labrador, and the eastern Canadian Provinces (New Brunswick and Nova Scotia). This may be considered the first stage of their flight. It is interesting to notice here that the Whimbrel (*Numenius phaeopus*) and the Ring Plover (*Ægialitis hiaticula*) which breed in Greenland and about Cumberland Gulf also in migrating fly across the prevailing southwesterlies of the north Atlantic, which brings them to the shores of Europe and Africa, instead of down the American coast, as it might be supposed they would come. As a matter of fact, the Whimbrel is unknown on the eastern sea-board of the United States, while the only record for *Ægialitis hiaticula* in America (south of its breeding grounds) is Barbados (September 10, 1888), to which island a number of European birds (for instance *Pavoncella pugnax*, 1848 and 1878, *Vanellus vanellus*, 1886, *Hydrochelidon leucoptera*, 1888, and *H. hybrida*) have strayed.

Mr. William Brewster believes that the Whimbrel and *Ægialitis hiaticula* in eastern Arctic America are merely colonies, the birds from which would most naturally go south during the migrations by the route taken by others in the European habitat of the spe-

cies; and the fact that they cross over to Europe and then proceed to southern Africa instead of going to southern South America is merely due to their starting on their journey by the same route by which they originally reached the territory. This, however, is not so serious an objection as might at first sight appear; for very possibly the species were first established in those regions by certain individuals or companies getting off the main track of the migrations north along the coasts of Africa and Europe, and, directing their course from perhaps northwestern Africa across the prevailing southwesterly winds (in the spring), finally reaching land in Greenland and the regions immediately to the west of it.

Starting from Labrador and the eastern Canadian Provinces, the Golden Plover would fly in a southeasterly direction, across the prevailing southwesterly winds until the latitude of Bermuda was reached. This would bring them to a point a few hundred miles to the eastward of those islands. Here the course would change to westerly, and then southwesterly in the 'horse latitudes.' The variable and rather light winds which occur here at this season would tend to scatter the flocks somewhat, and we should expect the line of migration to be somewhat wider from this point south. The prevailing southeasterly, then easterly winds in the 'horse latitudes' would cause them to go first in a southwesterly direction, becoming more southerly as the northern limit of the northeast trades was approached. They would begin to feel the effects of the trades in a position due east of the Bahamas, and due north of Porto Rico. Their course would then change from southerly to southeasterly, and they would pass along just to the eastward of, and over, the Lesser Antilles, reaching northern South America in the Guianas. At the season when the birds reach the Guianas, the wind in that district is very light, but what little there is comes from the east. Here they stop and feed (being in a very lean condition after their long flight) and appear, from what I can learn from people who have travelled in the interior of British Guiana, to follow up the rivers into the higher land.¹

¹ There is a specimen in the British Museum from Mt. Roraima, and one from the Maroni River, Surinam.

From this point their course is not accurately known ; but if we apply this theory, they would follow down the northeastern tributaries of the Amazons until they came within the influence of the southeast trades, which would carry them southwest, over central Amazonia toward Peru and Bolivia.¹ Somewhat northwest of the Matto Grosso region, the birds would come under the influence of the easterly winds on the southern border of the trades, which would turn them south, and gradually (as they became more northeasterly) southeast, which would bring the plover into the prairie region of the Argentine. Here the prevailing westerlies of the pampas region would be felt, and the birds would, under their influence, continue down the eastern part of Patagonia toward Tierra del Fuego.

In returning, the birds would first go north (across the prevailing westerlies), until in the vicinity of Buenos Ayres, and the country just to the west of it where they would encounter northeasterly winds, which would turn them inland, up the valley of the La Plata and along the plains to the east of the Andes, the course gradually becoming more northerly, and then northeasterly in the area covered by the southeast trades. They would reach the Amazons valley in its western half, and then under the guidance of the northeast trades fly northwest, toward the isthmus of Panama and Central America. The course from here would be northwest across the trades to Texas and the Mississippi Valley. The birds follow up this valley, northward, and then, on reaching Canada fly northwest, across the prevailing southwesterly and westerly winds to their breeding grounds in western Arctic America.

This, then, would be the path travelled by the main flights of the Golden Plover. Those flocks which visit the lakes of Maine and the eastern seacoast of the United States may very well be parties which have become detached from the main body, perhaps during a period of squally weather, with uncertain and variable winds, conditions very liable to occur at the time of their journey south.

¹ There are specimens in the British Museum from Peru taken in September and October.

Col. Feilden remarks (*Ibis*, 1889, and *West Indian Bulletin*, III, [1902], *loc. cit.*) that "a shift of wind from the northeast, with squally weather to the southeast is ardently longed for by the Barbados sportsmen towards the end of August, as this forces the migratory hosts [of shore birds] to alight instead of passing over at a great height, as they are seen to do when the wind is from the northeast."

Along the coast of Cape Cod, Massachusetts (where the wind should be west or southwest to favor their flight), the gunners have observed that numbers of Golden Plover sometimes appear if the wind happens to be northeast at the time they are passing; but if the wind shifts to the southwest, they all disappear. These two instances seem to offer additional evidence that the birds are to a considerable degree reliant on the direction of the wind to guide them in their flight.

Mr. Brewster believes that the knowledge that an immense supply of food awaits them in Labrador would be more potent in bringing the plover to that district than the direction of the wind. Here, as in the case of the parallelism between the course taken in the first stage of the migration by Golden Plover, and by the Whimbrel and *Ægialitis hiaticula*, the result would be the same, no matter which was the true cause; but it seems to me that the question of food cannot influence these plover, as, although the old birds may remember the attractions of Labrador in regard to food, the young of the year, which have never seen the place could hardly be influenced in the direction of their flight by any such considerations, and in this species the young and old do not migrate together, but the first to arrive at any given point are invariably adults, and nearly all males; next come the females, and, about twelve days after the main flight of the adult males, the light-breasted young. It may, of course, be argued that the old males lead the way, followed by the females and the young; but it seems more probable that all are guided by the same cause, as otherwise we should expect the young, if they should for a few days lose sight of the others, to get off the track and turn up at places remote from the usual path of migration, a thing which they are no more liable than the adults to do.

Of course it is probable that in wide and rich valleys, like those

of the Mississippi and La Plata, and to a lesser extent the rivers of the Guianas and the northeastern tributaries of the Amazons, the birds are guided largely by their direction, and the courses of the streams; but it seems as if outside of these areas, we must look for the key to the course of their flight in the direction of the winds, as by no other method can we satisfactorily explain (1) why they pass over the West Indies always from northwest to southeast, (2) why they are usually observed to migrate with a 'beam' wind, (3) why they never alight on Barbados or the other West Indies if the wind is northeast, but only if it comes from the southeast or some other direction, not necessarily contrary to their course, (4) why they appear on the Massachusetts coast during northeast winds, but leave if the wind changes to the southwest or west, and (5) why they reach the South American continent in the Guianas on their journey south, but leave it at the isthmus of Panama in coming north.

LIST OF BIRDS SEEN IN JEFFERSON PARISH,
LOUISIANA, APRIL 1, 1904.

BY H. H. KOPMAN.

THE following list of 64 species seen by the writer and two companions, Messrs. Andrew and W. B. Allison, during an extended walk near New Orleans, April 1, 1904, presents the typical bird-life of the section at that season with an unusual degree of closeness to what might be considered the ideal typical state of the avifauna. The season was absolutely normal, no extremes of cold having occurred during the winter, and the spring having developed slowly but practically uniformly from small beginnings after the first week in January, and more rapidly and without the slightest interruption from the cold, after the 20th of February.

Because the list gives a typical view of our bird-life at the season in question, and because it is the largest Louisiana list of

which I have any record, I have concluded that it would be of interest to observers in other parts of the country. It is not remarkable for rare species. In fact, there are scarcely any unexpected birds in it, while nearly everything that might have been expected in the character of country visited was recorded during the fifteen hours spent afield, from 6 A. M. to 9 P. M. No additional species was recorded after about 7.30 P. M. Resident birds, a few of the winter visitors, and summer visitors, arrived and arriving, gave the predominant character to the bird life of the day. Species purely transient were little in evidence. The weather was too stable and rather too warm for the marked movement of transients that had been noted two days before.

*Sixty-four Species of Birds seen by Andrew Allison, W. B. Allison,
and H. H. Kopman, April 1, 1904, in Jefferson Parish,
Louisiana, West Bank of the Mississippi, opposite
New Orleans.*

1. *Larus delawarensis*. RING-BILLED GULL.—Several of these wintering gulls were still present on the river.
2. *Florida cærulea*. LITTLE BLUE HERON.—Though the species had arrived some time since, we saw only one in the country we crossed.
3. *Nyctanassa violacea*. YELLOW-CROWNED NIGHT HERON.—We saw two before dark and heard several after dark.
4. *Gallinago delicata*. WILSON'S SNIPE.—Andrew Allison was the only member of the party who touched at a spot where we are almost sure of finding the Snipe in spring. In this wet pasture he saw a few of the birds.
5. *Helodromas solitarius*. SOLITARY SANDPIPER.—We saw but one, though it is usually common at this season.
6. *Oxyechus vociferus*. KILLDEER.—The Killdeers were seen by Mr. Allison in the same spot as the Snipe.
7. *Colinus virginianus*. BOB-WHITE.—Though not well established about New Orleans, this species is occasionally found in the vicinity. A covey that we have observed repeatedly was found in the usual place on open briery land.
8. *Cathartes aura*. TURKEY BUZZARD.—Usual numbers.
9. *Catharista urubu*. BLACK VULTURE.—Usual numbers.
10. *Buteo lineatus* (*alleni*?). (FLORIDA?) RED-SHOULDERED HAWK.—Saw one pair, circling rather high, but resident birds.
11. *Syrnium varium alleni*. FLORIDA BARRED OWL.—Heard several.

12. *Megascops asio floridanus*. FLORIDA SCREECH OWL.—Heard one after dark.

13. *Ceophloeus pileatus*. PILATED WOODPECKER.—Though this species is rather common, and sometimes fairly conspicuous in the country through which we went, we heard but one this day.

14. *Dryobates pubescens*. DOWNY WOODPECKER.—Noted several.

15. *Dryobates villosus audubonii*. SOUTHERN HAIRY WOODPECKER.—Noted one or two.

16. *Centurus carolinus*. RED-BELLIED WOODPECKER.—In the growth of a slough which our road followed for a long distance, and in some rather deep woods through which we passed later, this species was very common.

17. *Colaptes auratus*. FLICKER.—This species is an infrequent breeder about New Orleans, and as all the winter residents had gone, we saw but one bird.

18. *Chætura pelagica*. CHIMNEY SWIFT.—Though the first arrived the 19th of March, we saw but a few this day.

19. *Trochilus colubris*. RUBY-THROATED HUMMINGBIRD.—Thoroughly common. Arrived March 23.

20. *Tyrannus tyrannus*. KINGBIRD.—Never very common in Louisiana in spring. We saw but one. The first had been noted March 23.

21. *Myiarchus crinitus*. CRESTED FLYCATCHER.—Rather common along the slough where so many Red-bellied Woodpeckers were seen. Arrived March 30.

22. *Sayornis phœbe*. PHŒBE.—A single bird still lingered where I had seen it on two recent trips. The day of its departure was very close at hand, the last never having been seen later than April 6.

In the matter of flycatchers, the trip was rather disappointing. March 30, two early arrivals, the Wood Pewee (*Contopus virens*) and the Green-crested Flycatcher (*Empidonax virescens*), had both appeared, one of each species being noted, but neither was seen April 1. The recording of the Green-crested Flycatcher March 30 antedated any previous arrival record for this latitude by six days, so it was not surprising that none was noted April 1. The Wood Pewee, however, might readily enough have been seen.

23. *Corvus brachyrhynchos*. AMERICAN CROW.—Common.

24. *Corvus ossifragus*. FISH CROW.—We heard this species only early in the morning near the river.

25. *Cyanocitta cristata florincola*. FLORIDA BLUE JAY.—Seen in only one locality, a briery pasture bordered chiefly by small live and water oaks. At this one spot it is nearly always seen.

26. *Agelaius phœniceus*. RED-WINGED BLACKBIRD.—The long slough was the only breeding situation of this species we visited. Here we saw a few. The bulk of the residents had departed for their breeding grounds in the marshes.

27. *Molothrus ater*. COWBIRD.—A single one was seen on the edge of a weedy field.

28. *Sturnella magna argutula*. SOUTHERN MEADOWLARK.—The observations made in regard to the Bob-white about New Orleans are applicable to this bird. Andrew Allison saw one of several that have become established in and about the pasture where he saw the Snipe and Killdeer.

29. *Icterus spurius*.—ORCHARD ORIOLE.—Males were very common, and we saw the first female. The first males arrived March 25.

30. *Quiscalus quiscula aglæus*. FLORIDA GRACKLE.—Abundant.

31. *Megaquiscalus major*. BOAT-TAILED GRACKLE.—Abundant, one large flock and many single birds being seen, though the majority had left for their breeding grounds in the marshes

32. *Zonotrichia albicollis*. WHITE-THROATED SPARROW.—Rather common; singing occasionally.

33. *Spizella pusilla*. FIELD SPARROW.—This was certainly the most unexpected bird of the day, for while it is common in some parts of the bluff and sandy lands further north in the State, it is rare in the flat alluvial lands of the southeast. The single one seen appeared in the same spot where I had seen one March 23, and was doubtless the same bird. This was in the dry, brier-grown pasture to which reference has already been made.

34. *Melospiza georgiana*. SWAMP SPARROW.—Not very common, but showing about normal numbers for the season.

35. *Passerculus sandwichensis savanna*. SAVANNA SPARROW.—Only a few seen in the morning.

36. *Pipilo erythrophthalmus*. TOWHEE.—Seen at only one spot, the thickets about the pasture where we saw the Blue Jays and the Field Sparrow.

37. *Cardinalis cardinalis*. CARDINAL.—As noisy, melodious, and abundant as ever.

38. *Cyanospiza cyanea*. INDIGO BUNTING.—There was no increase over the number seen March 30, when the species arrived. About 3 were seen.

39. *Piranga rubra*. SUMMER TANAGER.—A male in all but perfect plumage was recorded as the first arrival for 1904. This is next to the earliest date of which I have any record, one having been seen by Andrew Allison at Bay St. Louis, Miss., March 31, 1902.

40. *Progne subis*. PURPLE MARTIN.—The only one I observed was heard in New Orleans in the morning just before I crossed the river.

41. *Hirundo erythrogastra*. BARN SWALLOWS.—The only ones we saw were three or four that passed with some Tree Swallows in the morning. These were the first arrivals recorded.

42. *Iridoprocne bicolor*. TREE SWALLOW.—Ordinarily common.

43. *Vireo olivaceus*. RED-EYED VIREO.—Rather common, at least well distributed. The first had arrived at Covington, in the pine woods north of New Orleans, March 20.

44. *Vireo noveboracensis*. WHITE-EYED VIREO.—In normal abundance.

45. *Compsothlypis americana ramelinæ*. PARULA WARBLER.—As abundant as usual, many having begun to nest. Arrived March 7.

46. *Protonotaria citrea*. PROTHONOTARY WARBLER.—Hardly as widely distributed as March 30. The first came March 19.

47. *Helinaia swainsonii*. SWAINSON'S WARBLER.—In a brake of switchcane in a rather dense wood of Texas red oak, water oak, live oak, box elder, red maple, ash, haw, hackberry, and elm, where we can usually count on finding this species in spring, we heard several singing, and Andrew Allison took one specimen. The notes of this species were almost constantly intermingled with those of the Hooded Warbler, to which they bear considerable resemblance. We observed that the first part of the song was tremulous and quavering, highly modulated and slightly complex, but that the termination was very similar to notes of the Hooded Warbler. The species had probably arrived several days before. We have never been able to prove that the spot where we found it is a breeding ground, though the species is well established there in the middle spring.

48. *Dendroica dominica albilora*. SYCAMORE WARBLER.—The species was not singing much. The first arrived March 12.

49. *Dendroica coronata*. MYRTLE WARBLER.—Noted only a few. The bird is sometimes still abundant this late, but the mild character of the whole spring had advanced their movement a week or so.

50. *Dendroica æstiva*. YELLOW WARBLER.—Where I had seen the first bird of the season, March 30, in some willows in the slough, there was still one this day. It was doubtless the same bird, and was in song as on the previous occasion. April 2 had been the earliest date for arrival previous to this.

51. *Geothlypis formosa*. KENTUCKY WARBLER.—There had been no special increase in numbers over the number seen March 30, when the first arrived.

52. *Geothlypis trichas*. MARYLAND YELLOW-THROAT.—Saw only a few.

53. *Wilsonia mitrata*. HOODED WARBLER.—As abundant as usual. The first had arrived March 12.

54. *Parus carolinensis*. CAROLINA CHICKADEE.—Nothing out of the ordinary was noted in regard to this common resident.

55. *Bæolophus bicolor*. TUFTED TITMOUSE.—In statu quo, like the Chickadee.

56. *Mimus polyglottos*. MOCKINGBIRD.—Owing to the prevalence of trapping in Jefferson Parish before the new bird law was passed, Mockingbirds have not been very common there of late years, and we saw only a few, at distant points.

57. *Galeoscoptes carolinensis*. CATBIRD.—The spring transients of this species are rarely present here in large numbers. We saw but two.

58. *Toxostoma rufum*. BROWN THRASHER.—Common and somewhat musical. These birds were probably all transients, certainly not summer visitors, as the species is not known as a breeder in southern Louisiana.

59. *Thryothorus ludovicianus*. CAROLINA WREN.—As conspicuous and musical as the Cardinal.

60. *Troglodytes aëdon*. HOUSE WREN.—This winter visitor was still present, some half dozen being noted.

61. *Hylocichla mustelina*. WOOD THRUSH.—We noted only two or three. The first came March 26.

62. *Hylocichla guttata pallasii*. HERMIT THRUSH.—Had become very scarce. We were constantly watching for them, but saw only two.

63. *Polioptila cærulea*. BLUE-GRAY GNATCATCHER.—Though the date of its general arrival had long passed, it was not particularly common this day.

64. *Regulus calendula*. RUBY-CROWNED KINGLET.—Saw only one, probably the last, though the species has often been seen a week later, and on one occasion as late as April 18.

Several species that we might readily have expected to see were :

1. Laughing Gull (*Larus atricilla*). Had disappeared from the river rather earlier than usual for its breeding grounds on the coast.
2. Wood Duck (*Aix sponsa*).
3. White Ibis (*Guara alba*).
4. Great Blue Heron (*Ardea herodias*).
5. Green Heron (*Butorides virescens*).
6. Pectoral Sandpiper (*Actodromas maculata*).
7. Bartramian Sandpiper (*Bartramia longicauda*).
8. Belted Kingfisher (*Ceryle alcyon*).
9. Painted Bunting (*Cyanospiza ciris*).
10. Rough-winged Swallow (*Stelgidopteryx serripennis*).
11. Loggerhead Shrike (*Lanius ludovicianus*).
12. American Pipit (*Anthus pensilvanicus*).

All the water birds mentioned above and a half dozen more we should have been practically certain of noting had we been able to include in our itinerary some of the marsh and water surfaces of the parish, so that a spring list of 75 species in Southeast Louisiana would be by no means impossible to establish, though I should never expect to see that number exceeded.

NESTING HABITS OF BIRDS IN MISSISSIPPI.

BY CHARLES R. STOCKARD.

AN ATTEMPT is made in the following article to condense and summarize, and as nearly as possible to bring out the most interesting facts noted while collecting for several years in various parts of Mississippi. It is evident to all readers that in arranging data of this kind some of the habits and customs of birds which are well known to most observers must occasionally be repeated. The nesting records of birds in one section of the country are not always strikingly different from those of another, particularly for the same species. But the manner of nesting does differ slightly in many and very strikingly in a few cases. In those localities where particular kinds of material and certain peculiar conditions predominate the method of nest building will differ widely from that which is followed in sections where such conditions do not prevail; this fact is shown clearly in many instances cited below. One observing the nesting habits of birds may at times be impressed by the constant fixedness of style followed, and then again the same observer will be surprised by the great diversity in nesting habits evinced by a single species.

My intention has been to arrange the data below so that they shall clearly and briefly show the facts regarding the usual nesting sites selected by different species, as well as to indicate the season during which each species deposits its eggs. Yet in many cases birds were observed to deviate markedly from the rule in their selection of nesting sites; such instances have been particularly enumerated and emphasized, as they appear to me of especial interest in showing on the one hand a faculty apparently similar to discretion in the choice of nesting places, while as evidently on the other hand some cases illustrate the most absurd stupidity. The ordinary manner of nest construction will not be given in detail and only in remarkable cases will most of the particulars be entered into. I have deemed it only necessary in most instances to give the extreme dates in any season on which the eggs of a species were recorded, because the notes extend over a period of nine years, during which time a great number of nests of one spe-

cies may have been noted, and it is useless to string out a list of the dates on which all these nests were observed.

1. *Podilymbus podiceps*. **PIED-BILLED GREBE.**—These birds are seen in Mississippi every month of the year, and often in considerable numbers. Many careful searches were made for their nests but all proved unsuccessful, though I am confident that they nest in the State.

2. *Sterna maxima*. **ROYAL TERN.**—This beautiful large tern is to be found nesting abundantly on the small islands to the south of Mississippi Sound. No nest is constructed, the eggs being placed on the bare sand. Sets were found consisting of two and four eggs each; those of four were very rare, only two such being observed. The earliest date on which they were taken was May 28, and the latest was June 21, 1903. There is no doubt that fresh eggs may be found during a much longer period than these dates indicate, as few trips were made to the islands. Mr. C. Delmas of Scranton has collected on the islands near that place many eggs of these birds as well as those of the Cabot's Tern.

3. *Sterna sandvicensis acuflavida*. **CABOT'S TERN.**—This tern is found breeding on the islands in company with the Royal Tern. In Mississippi Sound one finds many eggs of this species in the latter part of May and June. All the sets observed contained one or two eggs; never as many as three were found in a set. No nest is built, the eggs lying on the sandy ground of the island. The earliest sets were taken on May 28, 1901, almost all consisting of fresh eggs, and the latest were found June 21, 1903, most of which contained well formed embryos, and many nestlings were seen on the islands at this time.

4. *Anhinga anhinga*. **ANHINGA.**—This bird is commonly known in Mississippi as the Water Turkey. They are often noticed in autumn and winter flying in large flocks. During the breeding season they are rarely observed unless one visits some swampy wood, or better some lake that is situated in a dense timber-land. There the Anhinga will be found nesting in small colonies. Nine occupied nests was the largest group found, but usually only from three to five pairs nest about a small lake. The nest was rather loosely constructed of sticks and was very shallow, being little more than a platform, suggesting at once the architectural style so commonly employed by the herons. The Little Blue Heron was found nesting about the same lakes with the Anhingas. The earliest eggs were taken on April 21, 1901, and the latest on May 14, 1902. As the nesting localities have not been at all constantly observed, the laying season may well have wider limits. Four eggs constituted the full set in all cases noted.

5. *Ardetta exilis*. **LEAST BITTERN.**—The nest of the Least Bittern was not found, although the birds were present during the nesting season. They were always very rare, however, in the marshes in which I collected.

6. *Hydranassa tricolor ruficollis*. LOUISIANA HERON.—In the marshes of the western and southern portions of the State many of these herons were found nesting, usually in company with the Little Blue. The nests were placed near the ground in small trees or bushes and were built in the careless heron style. Four eggs constituted the complete set, and the earliest date of collecting these eggs was May 11, 1896, the latest being June 12, 1902.

7. *Florida cœrulea*. LITTLE BLUE HERON.—A very common species in many parts of the State where it was found breeding in small colonies and sometimes alone. All complete sets contained four eggs. The nests were placed from ten to thirty feet above the ground in swampy woods and small marshes. Many of these herons nested along the Tombigbee River in the eastern part of Mississippi, and they were also common on the lakes in counties bordering the Mississippi River. Their nesting season commenced about the middle of April, and the latest eggs were taken June 4, 1900.

8. *Butorides virescens*. GREEN HERON.—This bird is generally known by the odd name of "Shitepoke," a name whose probable meaning and origin will be readily understood by those acquainted with early English who have noticed a certain action of the Green Heron when suddenly leaving the ground. The Green Heron does not appear to be as partial toward wooded districts for nesting localities as the other herons of the State. They were often found nesting in small willows and bushes that grew along the edges of drain ditches passing through open pastures and fields. I have failed to find this bird nesting in company with the other herons, and rarely more than two pairs were found making their homes in any one vicinity. The sets were composed of three and four eggs each. May 5, 1895, was the earliest, and June 11, 1900, was the latest date on which complete sets were collected.

9. *Nycticorax nycticorax nævius*. BLACK-CROWNED NIGHT HERON.—The writer has not found this bird at all abundant, though he was unable to visit some of the heronries claimed to exist in the swamps bordering the Mississippi River. In a small marshy wood in the eastern part of the State, Lowndes County, several pairs of this heron were found to make their homes each year. Large water-oak trees appear to be their favorite site, and one such tree in the spring of 1897 was found to contain nine nests, only two of which were occupied at that time. Trees in this wood during the breeding season are surrounded by water about eighteen inches in depth, caused by the heavy spring rains which drain in from the neighboring fields. All sets observed consisted of four eggs. The date of the earliest set was March 21, 1895, and of the latest May 11, 1897. The nests were all placed on horizontal branches, usually a considerable distance away from the tree trunk, and on this account they were often reached with difficulty. In all cases they were mere platforms of sticks.

10. *Rallus elegans*. KING RAIL.—Only one nest of this fine rail was seen and it was placed on the ground and formed of reeds. The eggs

were well concealed by the thick mat of grass that drooped over them. This waste of reeds covered several acres along a marshy stream border and was a favorite resort for many Red-winged Blackbirds, Maryland Yellow-throats, and other marsh lovers. The above mentioned nest contained six fresh eggs on June 29, 1896.

11. *Rallus crepitans*. CLAPPER RAIL. — These birds are found laying in the brackish marshes near Scranton, Mississippi. On my only visit to these places one set of ten slightly incubated eggs was collected. The nest was on the ground, raised several inches above the surface by a heap of reeds that was piled under it. The thick growth above hid the eggs from view, and they would have been passed over but for the fact that the female was flushed from them.

12. *Porzana carolina*. SORA. — I have observed this species in Louisiana but have never seen one in Mississippi, although no doubt they occur in the marshes along the river in the northwest portion of the State.

13. *Actitis macularia*. SPOTTED SANDPIPER. — These birds were present throughout the year, more abundant in winter than in summer, but their nests were never found.

14. *Oxyechus vociferus*. KILLDEER. — This plover is rather abundant in all sections of the State, and at times other than the breeding season will be found feeding in small flocks. They nest throughout Mississippi, always on the ground and, in the large number of cases observed, in open fields and pastures. The eggs are never hidden in grass or weeds but are placed in slight depressions on the bare ground or on a short grass turf. The saucer-like depression of a nest has scattered in it bits of shells, small pebbles, short pieces of weeds or sticks, and often small bits of crayfish armor. This rubbish is never arranged so as to form a real nest since only a few bits of it are scattered in the depression and can apparently serve no purpose whatever except to suggest to the observer that the Killdeer has a slight nest-building instinct either in an incipient or a rudimentary condition. The earliest set was taken on April 17, 1897, and the latest June 6, 1900. All full sets contained four eggs. Whenever the female is flushed from her nest she pretends to be unable to fly and staggers off in a wounded manner fluttering along the ground. This action is evidently intended to allure the intruder into a chase and thus draw him away from her nest.

15. *Colinus virginianus*. BOB-WHITE. — The Bob-white is still abundant, though becoming scarcer each year, at the hand of the sportsman. In fields of sedge grass or oats many pairs will often nest very close together. June, 1895, I found in a thirty acre field of sedge grass sixteen nests of the Bob-white, all containing large sets, ranging from twelve to twenty-two eggs, and the total number of eggs in this field must have been about three hundred. As the eggs were not taken the exact total was not known. In 1897 a ten acre oat field contained six nests, but in the last several years I have not observed more than three or four nests in one field and usually only one was found. The earliest complete set was

seen June 3, 1896, and the latest fresh eggs on June 29, 1900. The nest was almost invariably placed at the base of a clump of sedge grass, oat stalks, or a small shrub; it is usually composed of long grass blades and well arched over so that the eggs are only visible from the direction toward which the entrance faces, except in some cases where the roof is poorly made. In large sets the eggs often roll out at the front and sides of the nest so that the bird has difficulty in keeping them all within the nest basin.

16. *Meleagris gallopavo silvestris*. WILD TURKEY. — The Wild Turkey is still rather common in some parts of Mississippi, chiefly in large deep woods. One may often see them in small droves during the autumn and winter. The nests are rarely found, only two being observed by the writer, and in one of these cases I was conducted to the place. The sets consisted of eight and eleven eggs, slightly incubated in both instances. The first eggs were found May 14, 1895, in Lowndes County, and the second were seen on May 26, 1902, in Adams County. The nests were well concealed in thick weeds and arched over by low bushes and vines near the edge of dense woods. There was a definite path of entrance through the weeds formed by the birds in both cases. The eggs were placed on a few leaves and straws irregularly raked together, forming at best a very droll structure.

The sites selected by domesticated turkeys where they run on large and wooded ranges are very similar to these, and, excepting the fact that the area is a little more limited, their nests are just as difficult to discover. They go in under dense bushes and vines and almost completely hide their eggs, and any one who has attempted to find them can appreciate fully the masterly manner in which they are hidden.

17. *Zenaidura macroura*. MOURNING DOVE. — This species is extremely common and in fall and winter they are seen collecting in large numbers. Late in summer they begin roosting in company and many hundred come about sunset to their chosen place for the night. During this season they are shot in large numbers while flying to the hedge or small wood that has been selected as a roosting place.

Doves often nested in small colonies. In a clump of about fifteen young pine trees I once found nine nests, and in an orange hedge about one half mile long twelve nests were located. But most doves nest singly, or with the nests too far apart to suggest any gregarious nesting habit. The nest is scarcely more than a mere platform of sticks, and the eggs are often visible through the floor on account of its loose arrangement. In only one instance a nest was found placed directly on the ground; it was constructed of small sticks and grass roughly arranged and set in a slight depression. The earliest nest was found May 1, 1900, and the latest June 19, 1902. Two eggs always composed the set. The female of this species also leaves her nest in a wounded fashion. She drops in a semi-helpless manner from the limb on which the nest is placed, and flutters along on the ground as if struggling desperately to

escape the intruder. All doves are not given to this trick as some fly swiftly from the nest tree without any attempt to cajole the collector. I made special observations to ascertain whether or not there was any relation between the action of the bird on leaving the nest and the condition of the eggs or young. My results were entirely negative; some birds were seen to perform in a frantic manner after leaving perfectly fresh eggs, while others would fly in an ordinary way from a nest containing young. The actions seemed only dependent upon the feelings or nature of the mother.

18. *Cathartes aura*. TURKEY VULTURE. — Only five nests of this vulture were observed, the earliest on March 21, 1898, and the latest fresh eggs on April 25, 1902. The breeding places selected were either the hollows of fallen logs or the hollows in large stumps. A pair will continue to use the same nest for many consecutive seasons even though their eggs were taken during the previous year. (For fuller details of nesting habits of Vultures see Stockard, 'Nesting Habits of Woodpeckers and Vultures in Mississippi.' Auk, Vol. XXI, No. 4.)

19. *Catharista urubu*. BLACK VULTURE. — The earliest set from this species was taken on March 11, 1902, but a set was collected on March 16, 1901, that had been incubated for about three weeks; thus it was probably laid as early as February 23. April 19, 1902, the latest set was found, which was the second set of that season for the same pair, and as far as I am aware this is the only case recorded of two sets within one season from the Black Vulture.

20. *Accipiter cooperii*. COOPER'S HAWK. — A very common hawk in Mississippi, where it is rather retiring in its nesting habits, usually selecting a deep wood in which to rear its brood. The eleven nests observed were all located high up in oak or hickory trees which usually stood more than a quarter of a mile within the wood. The nests were built early in the year, generally about the last of February, and were at this time fully exposed to view from all sides, since the nest trees had not yet put forth their leaves. But about the time the young had hatched, late March or early April, the foliage had become sufficiently dense to almost completely conceal the nest. I have never known this hawk to use the same nest for a second season, or to use any other old nest, but all observed built new nests each year. The numbers of eggs composing sets were three and four. The earliest set was found on March 2, 1895, and the latest on April 5, 1899. Their laying season reaches its maximum about the middle of March.

21. *Buteo borealis*. RED-TAILED HAWK. — This hawk was found in all the farming districts of the State, and seems to remain almost constantly in any locality that it may choose for a hunting ground. A certain pair can be observed almost at any time within their small domain, and they apparently retain this as a home for many years. When one Red-tail's nest is found in a wood the observer may feel quite certain that similar nests will be constructed near this one for several seasons to

follow, even though their eggs are removed each year. But I have failed to note them using the same nest for more than a single season; new nests were always built each year. Their homes were made in more or less dense timber-lands, and at times in the depth of heavy swampy woods, never in open fields and pastures where the Broad-winged Hawk so often makes its nest. Large oak and hickory trees were the favorite sites selected by *borealis* for nesting. The bulky nest was well made of sticks, leaves, bark, and moss, and lined with fibrous bark, moss, and feathers; it was placed in a main trunk crotch or in a crotch of one of the large oblique branches. All sets contained only two eggs each. The maximum laying time was about the middle of March; the earliest set seen was March 3, 1898, and the latest eggs were found April 24, 1896. This hawk is much detested by farmers and when its nest is found it is fired into with shotguns, thus destroying the brood.

22. *Buteo lineatus*. RED-SHOULDERED HAWK.—The Red-shouldered is strikingly similar in nesting habits to the Red-tailed, and was, I believe, the more abundant of the two species in the State. Its nests were also placed in large oak and hickory trees, usually in dense woods but sometimes in thickly grown brakes. The writer has observed many nests of this species, but must also state that in no case have they been found using the same nest for more than one season. They, also, like *borealis*, seem partial to a particular wood as a nesting locality after it has once been chosen. The sets contained only two eggs. The time of principal laying seemed somewhat later than the middle of March. March 6, 1896, was the earliest nest found to contain eggs, and April 18, 1900, a set of comparatively fresh eggs were taken.

23. *Buteo platypterus*. BROAD-WINGED HAWK.—Although I have observed only one pair of these hawks while nesting the case proved very interesting. Through an open pasture, bordered on two sides by rather thick woods, ran a small stream only a few feet wide with a line of large cotton-wood trees along its course. On entering this pasture April 4, 1898, a hawk's nest was seen in one of the cotton-wood trees which was at this date in rather scanty foliage. To convey some idea of how completely exposed this large nest was, it may be stated that it was seen for the first time and recognized to be a hawk's nest from a distance of at least one half mile. It contained a set of two eggs. Situated in another one of the cotton-wood trees, about fifty yards distant, was a similar nest, probably of the previous season. On April 13, 1899, in the same line of trees and about two hundred yards distant from the 1898 nest, was a new nest containing two eggs. Thus for three seasons apparently the same pair had used this line of trees as nesting sites. The pair of hawks could be seen circling about the pasture almost any day of the year. In 1900 I again attempted to locate their nest but failed; the cotton-woods were deserted and the birds were not to be found.

24. *Haliaeetus leucocephalus*. BALD EAGLE.—This bird is rather common in the western portion of Mississippi along the river. I have

never seen its nest in the State, but it is said to breed year after year in the tall swamps of the river counties. There is a cypress brake bordering a lake shore in Catahoula Parish, Louisiana, where a pair of Bald Eagles rear their brood each year. The same nest is used season after season and is situated far up in the topmost branches of a huge cypress tree. This brake is about twenty-five miles from the Mississippi River, west of Natchez, Mississippi.

25. *Falco sparverius*. AMERICAN SPARROW HAWK. — The Sparrow Hawk was rather abundant in towns and villages as well as through the country districts. I found them in Adams County nesting in a manner almost social or colonial. In a newly cleared field there were many old stumps of deadened trees, some of which were very tall, and many pairs of this little hawk were nesting in these stumps. Some were in natural cavities and others in the deserted burrows of Pileated and other woodpeckers. On March 18, 1901, four hollows in this 'deadening' contained four eggs each; no nests were built in the hollows. On April 2, 1902, three other sets of four were found in the same locality. Many more pairs nested here, but most of the dead trees were impossible to climb without danger; thus few nests were observed. This clearing was about one mile long and half a mile wide.

26. *Syrnium varium*. BARRED OWL. — This is the common large owl of the State, and almost every wood, large or small, has its Barred Owls. On passing along almost any country road after sunset the hoot of this owl is heard, and where the road leads through the wood it is not at all uncommon to find one or two of them perched on some lower branch of a large tree. Then the owl will incline its body forward and peer at the passer-by in a most amusing fashion, stretching and twisting its neck and bobbing its head up and down in a remarkable way.

The eggs are laid in large hollows of trees, which are usually located in thick woods. No nest is made in the cavity, the two eggs lying directly on the soft floor of decayed wood. A pair was observed to occupy the same hollow for four years, and it was stated that the owls had reared their young in this place for many seasons before. All sets consisted of only two eggs. They are rather early layers, a set being seen on February 2, 1903, in Adams County, and another on February 18, 1895, in the east central part of the State, while the latest eggs were found on March 11, 1898; at all later dates the nests contained young. One nest was found to contain young about one week old at the early date of February 28, 1903, so these eggs were probably laid in the month of January, although not knowing the period of incubation for this bird I am unable to give a definite calculation.

The young were easily reared and fed on almost any kind of meat, being especially partial to small fish and the common crayfish. But they finally, after being fed on other diet, took a marked dislike for beef and would often go hungry rather than eat it. I reared a fine pair of these birds in 1903, and after they became able to fly and were set at liberty

they returned each day about sunset to their familiar feeding shelf and cried for food; after being gorged they flew away again to the near-by wood. They continued this habit for about one month after being liberated; I then left this locality and so was unable to observe them longer.

27. *Megascops asio*. SCREECH OWL. — The Screech Owl is abundantly distributed over all parts of Mississippi. Its shivering screechy cry is commonly heard around the farmhouses at night. This owl will also nest year after year in the same hollow. They usually select a small cavity such as an old Flicker's burrow or natural cavity and in this they build a shabby nest of small sticks, but in two instances observed the eggs have been found lying on the soft chips in the bottom of woodpeckers' burrows with no attempt at a nest. One pair was found nesting in a box that had been prepared for Purple Martins. The sets were all rather small in comparison with those reported from other parts; never more than four and usually three eggs composed them. The earliest set was taken March 14, 1903, and the latest on May 3, 1902, well incubated and placed in the martin box mentioned above. Both red and gray types of this owl were common and the two types mate together about as often as they mate straight. The broods are commonly mixed, some individuals being red and others gray. This might prove interesting material for the study of inheritance.

28. *Bubo virginianus*. GREAT HORNED OWL. — Occasional individuals of *virginianus* are seen throughout the State. They probably nest also, as they are found at all seasons, but I have never been so fortunate as to locate their breeding places.

29. *Coccyzus americanus*. YELLOW-BILLED CUCKOO. — This species is very common during spring and summer. It selects the wooded borders of streams and young groves as nesting localities. The nest is built much on the same general plan as that of the Mourning Dove, being so thin and loosely constructed that the eggs are usually visible through its floor. It is placed at a moderate height, ranging from eight to twenty feet above the ground, and in almost all cases rests upon a horizontal branch some distance from the trunk of the tree. Though sets of as many as six eggs are reported from other States, I have never seen more than two eggs in a nest. The earliest nesting date noted was May 5, 1896, and the latest was June 21, 1899. They are late layers and apparently have a long breeding season.

30. *Ceryle alcyon*. BELTED KINGFISHER. — This is a familiar fisherman in almost all of the lakes and streams. Its burrows are seen in the perpendicular banks of nearly all creeks and rivers, and they are also noted some distance from water in the sandy cliffs of hills. The tunnel-like burrow often extends back as far as eight feet, and rarely less than five. It is an almost cylindrical tunnel until the back portion is reached, where it flares out, forming a considerable chamber, ten or twelve inches across and with its top and floor scooped so as to give concave surfaces. These burrows are usually straight but occasionally bend at an angle,

possibly to avoid some obstruction in the line; they are always dug by the birds, and in all those observed were occupied only for a single season. This construction is very similar to that made by the Bank Swallow but is rather larger and extends further back. The two species were often seen building their burrows close together in the same bank. The Kingfisher builds no nest in its tunnel, although the floor of the back chamber is often strewn with pieces of crayfish shells that have been ejected from the stomach of the old birds. The Bank Swallow, on the other hand, places a rather neat nest of straws in the back of its burrow. The Kingfisher laid in all cases six eggs, and the earliest were seen on April 28, 1897, the latest on June 7, 1895. May is their chief month for laying. They often dig many shallow burrows in the same bank before striking the permanent nest cavity, just as woodpeckers do on their nest tree. After finding many Kingfisher burrows, some new and many old, I noticed that in the case of all occupied nests there was a slight ridge running along the middle line of the tunnel floor, which was due to the fact that the feet of the birds pressed down paths along the sides of the floor, thus leaving the middle ridge untrampled as they passed back and forth through the tunnel. Nearly all traces of this delicate ridge were obliterated in the old tunnels, particularly near their entrances, so that they were readily distinguishable from those occupied.

31. *Campephilus principalis*. IVORY-BILLED WOODPECKER. — I have never seen this woodpecker in Mississippi, although many claim to observe them in the western part of the State in the dense river swamps.

32. *Dryobates pubescens*. DOWNY WOODPECKER. — The earliest set of this species was taken April 20, 1900, and the latest on May 18, 1902. For fuller details of the nesting habits of Woodpeckers in Mississippi, see Auk, Vol. XXI, No. 4. In this article I shall give only the extreme dates on which sets were taken.

33. *Ceophlœus pileatus*. PILEATED WOODPECKER. — The earliest eggs were found April 1, 1901, and the latest set was seen on May 8, 1903.

34. *Melanerpes erythrocephalus*. RED-HEADED WOODPECKER. — May 12, 1901, was the date of the earliest set seen, and fresh eggs were found as late as June 14.

35. *Centurus carolinus*. RED-BELLIED WOODPECKER. — The earliest set was found on April 24, 1900, and the latest on June 2, 1900. These two extreme sets were both from the same pair, the last mentioned being the fourth set of the season. These birds have a remarkable capacity for continuous laying.

36. *Colaptes auratus*. FLICKER. — The earliest and latest dates on which eggs of this species were collected were April 12, 1896 and June 4, 1899.

37. *Antrostomus carolinensis*. CHUCK-WILL'S-WIDOW. — The call of the Chuck-will's-widow is a familiar sound throughout Mississippi, but to observe the bird is not a common pleasure, and to find its eggs is a difficult proposition indeed. The birds are migratory and reach home

rather late in spring, most of them about the middle or last of April. But since their brooding is such a simple process they begin laying soon after their arrival. No nest whatever is made, and the eggs that I found were placed on the bare ground in one case, and in three others on the pine needles that happened to be scattered upon the ground near the edge of thick pine woods. The pine straws showed no arrangement at all, so that after the eggs were taken up one could detect no difference between the spot on which they had been deposited and the surrounding straw. The earliest set was found on May 3, 1902, and the latest on May 23, 1903. The bird in two instances left her eggs in a wounded fashion, fluttering along the ground as if unable to arise and fly, evidently to call the intruder's attention from her eggs, and should he watch her actions very closely he finds trouble in locating the spot from which she arose, as the eggs are about as difficult to detect while lying on the ground as one could well imagine. In another case the bird arose and flew directly into the dense wood and was not again seen.

38. *Chordeiles virginianus*. NIGHTHAWK. — This bird is known in Mississippi as the 'Bull-bat' on account of the roaring noise it produces while swooping with its large mouth open to capture insects. About dusk during the summer months large numbers of these birds begin to circle over pastures and open fields scooping insects on the dart, and at this time they are foolishly slaughtered by pseudo-sportsmen who shoot them merely to watch the bird's graceful fall or to improve their skill as marksmen. Thus this useful insect destroyer is fast becoming less abundant.

The Nighthawk deposits its two eggs on the ground with no attempt at clearing or sweeping off a place for them. The mottled color of the eggs so closely resembles the earth on which they lay that there is more chance than skill in seeing them. One is very fortunate to find as many as two sets within the same season. The earliest set was found on May 5, 1899, and the latest was taken June 2, 1902.

39. *Chætura pelagica*. CHIMNEY SWIFT. — As in most other States the 'Chimney Swallow' is extremely common. After the breeding season is over they may be seen in immense droves of many hundred individuals circling about before going into some large unused chimney for the night. The chimneys of vacant houses as well as the unused ones of occupied dwellings form the familiar nesting places of these birds. The many sets observed contained either four or five eggs, usually four, and were taken as early in the season as May 15, and as late as June 17.

40. *Trochilus colubris*. RUBY-THROATED HUMMINGBIRD. — This beautiful little bird was common in all flower-gardens and orchards as well as in the meadows and fields. Owing to the minute size of their nest it is rarely found. In two cases I located vicinities in which I felt sure nests were situated and then carefully watched the female for some time until at last she buzzed to a limb and perched close to the nest. It seems that she is apt to thus expose the presence of her home if one will

patiently watch for thirty minutes or an hour. The sets of two eggs were in the usual delicate nests of down with outer coats of lichens, and both were placed upon horizontal branches, one twenty feet from the ground and the other about forty. The collecting dates were May 14, 1896, and May 9, 1899.

41. *Tyrannus tyrannus*. KINGBIRD. — The commonly termed "Bee-martin" is found nesting in fields, pastures, and along road sides and streams. Some nests could be reached while standing on the ground, but others were placed in the topmost boughs of oaks and gums. This bird is very noisy around its nest, and one with little experience can spot a nest tree by the actions of the birds some time before he is near enough to see the nest itself. It is usually conspicuously placed in the crotch of a medium sized horizontal branch. The sets consisted of three and four eggs. Kingbirds are comparatively late nesting in this locality, the earliest set being seen on May 10, 1896, and the latest on June 13, 1900.

42. *Myiarchus crinitus*. CRESTED FLYCATCHER. — The Crested Flycatcher is called in Mississippi by the misnomer Kingbird. It nests throughout the State, in every variety of hollow in tree or post as well as in martin boxes. The natural cavities of china trees seem to be their favorite sites. The nest is built on the bottom of the hollow and is rather elaborate, being composed of straw, fibrous tree bark, feathers, moss, and usually a cast off snake's skin, but several nests were seen without this supposedly indispensable component. The sets contained from four to six eggs, the earliest being taken on April 23, 1902, and the latest May 27, 1899.

One is struck by the profuse markings of this egg when he remembers how thoroughly it is concealed from ordinary view in the depths of a hollow. It forms the most *marked* exception to the general rule, that eggs laid in dark cavities are white. But when we recall the fact that the most typical hollow layers build no nest and usually make their own burrow, we are then led to believe, from the well made nest and highly mottled egg of this species, that the habit of laying in hollows is a comparatively recent acquirement. The random selection of cavities made by these birds seems to point toward the same conclusion.

43. *Contopus virens*. WOOD PEWEE. — This modest and attractive little bird is found nesting in the edges of most small woods and brakes as well as in the groves near houses. The nests are placed on horizontal branches at various distances above the ground, but always more than fifteen feet. This nest is a very shallow affair but neatly rounded and covered on the outer side with lichens and thus resembles a natural knot of the limb. All sets seen consisted of three eggs, and the earliest laying date for this species was May 17, 1897, the latest June 19, 1902.

44. *Empidonax virescens*. GREEN-CRESTED FLYCATCHER. — A species with most retiring habits. The nest may be found and removed without the birds having made their appearance or the slightest sound. Those nests observed were all in rather dense woods and in perfectly unfre-

quented places. Several nests were found in the east central part of the State, which were loosely built between the prongs of small forked branches ; the sides were plaited about these prongs, and the nest bottom was so thin that the eggs could be counted through it. The nests were also very flat so that care was necessary in collecting them to prevent the eggs from rolling out over the sides. Two nests taken in Adams County were very interestingly constructed, being composed entirely of Spanish moss woven between the prongs of small elm forks. A surplus of moss was used so that long beards or streamers of it hung down for a length of eighteen inches below the actual nest. This arrangement gave the exact appearance of ordinary bunches of this gray moss hanging from the branches. Both nests would have been passed unnoticed but for the fact that the birds flew off as I passed under the limbs. The extreme dates for noting eggs of this species were May 4, 1898, and June 19, 1901.

45. *Cyanocitta cristata*. BLUE JAY.—With the exception of the English Sparrow the Blue Jay is probably the most abundant bird in the State. The shade trees bordering the streets of towns, the groves near dwelling houses, trees along road sides, orchards, pastures, and pine woods as well as thick woods, are nesting localities of this bird. One nest was placed in a tree crotch not more than six feet from a bed-room window, thus one might look out on the bird as she sat calmly upon her eggs, and later she was not noticeably nervous while feeding her nestlings before an audience of several persons who observed the performance from the window.

(*To be concluded.*)

NESTING OF THE GOLDEN EAGLE IN MONTANA.

BY E. S. CAMERON.

Plates II-VI.

FOR two years (1903-04) a pair of Golden Eagles (*Aquila chrysaetos*) have nested near my ranch on the north side of the Yellowstone, opposite Fallon on the Northern Pacific Railroad ; and during 1904 I was able to keep the birds under constant observation. The nest was first discovered at the end of June, 1903, owing to the boldness of one of the parents which carried away a lamb in presence of an indignant shepherd who followed to ascertain the fate of his charge. He thus found the eyrie, along with two fully fledged eaglets ; and succeeded in ruthlessly



SITE OF GOLDEN EAGLE EYRIE IN THE BADLANDS, FERRY, MONTANA

killing one, although the female made good her escape by flight. I felt convinced that the eagles would use the eyrie again, and obtained a promise from the man's courteous employers (Undem Bros.) that the eagles should not suffer further molestation no matter how many lambs they might destroy. It is a curious fact that although the birds had carried off several lambs prior to the death of their offspring, they took none thereafter, and in 1904 entirely abstained from the practice, a proceeding which, with sheep all around them, I cannot explain. It seems difficult to believe that they connected their loss in 1903 with the theft of lambs and avoided a woolly prey in consequence; but, in the absence of any other explanation, I am inclined to pay this compliment to the extraordinary intelligence of the birds.

The eagles' eyrie was situated near the top of a scoriaceous rock in the badlands, a crimson pillar which crowned a high butte sloping abruptly to deep washouts. The upper part of this column consisted of easily detachable pink layers, called laterite by geologists, but scorix of every color strewed the base which rested on red ochre clay reminiscent of a painter's palette. Placed in a hollow niche of the wall face the eyrie was entirely enclosed and sheltered on three sides by a dome of rock. On the fourth, and open side, the enormous sunken nest greatly overlapped the seemingly inadequate ledge, which served as a support, and thereby secured the safety of the eggs and young. Obviously the situation was chosen to afford daily shade, for as long a period as possible, to the eaglets, which, as the day wore on, suffered intensely from the heat and were shaded by either parent when the afternoon sun shone upon them. It was possible to climb to a north ledge of the rock, immediately over and about a yard above the eyrie, but the whole pillar behind was seamed with a gaping fissure which threatened immediate collapse, while a sheer precipice yawned to the front or west. From this precarious position the accompanying photographs, were, nevertheless, obtained. On March 14 there was a snowstorm from the north, and towards evening the eagles flew slowly across the creek, on which my ranch was situated, when they were observed to tumble and recover themselves in the air, much after the manner of a Marsh Hawk, an evolution which greatly astonished me,

having never previously seen the like with these birds. They first commenced to carry sticks and pine tops to the eyrie on March 15 when there was deep snow, but were forced to suspend operations during a three day blizzard, the material already collected being thereby dispersed.

Not disheartened the birds began building again on March 25, and, as the hen sat on two white, yellow spotted eggs on April 2, they had evidently completed their nest within a week! (Plate III.)

One egg was more heavily blotched than the other, but I have never seen eagles' eggs in Scotland with such pale markings, though I am aware that such occur. The period of incubation was 35 days. The nest, which measured about 5 feet in diameter at the widest part, was constructed of sage brush stalks, greasewood, and pine tops, scantily lined with down from the eagle's breast. Soapweed and more pine tops were added after incubation had commenced, no doubt for the purpose of ornament, as pointed out by Mr. C. J. Cornish in 'Country Life' (London) of June 18, 1904. The same writer mentions an instance in California where the eagles decorated their eyrie with sacks! At first the nest was a rather neatly formed cupped structure precluding accident to the newly hatched young, but by the time the eaglets were a month old the constant trampling of the family had made it perfectly flat. The hen bird allowed me to reach the upper ledge and look over before leaving her eggs, when she would cleverly make a lift backwards with her wings, to clear them, and another, sideways, which floated her into space. She was often immediately joined by the male, and the two would then sail round, ascending in graceful spirals to an immense height, like all species of *Buteo*. Sometimes one bird would hang on the wind above the rock, and, anon rise with motionless wings like an artificial kite, to sink gradually down upon its perch. This was very pretty to witness. I have climbed to the eyrie when the female was apparently asleep, and although the wide awake nestlings would stare at me with wondering eyes, they never, even when six weeks old, communicated my presence to her.

The male eagle took no part in the duties of incubation but helped to brood the young birds and seemed the most assiduous in shading them after June 8 when they were a month old.



FIG. 1. GOLDEN EAGLE EYRIE. THE EGGS HATCHED IN 35 DAYS



FIG. 2. GOLDEN EAGLE EYRIE. EAGLETS 2 DAYS OLD



FIG. 1. EAGLETS 14 DAYS OLD.
Two bull snakes and part of jack rabbit in the nest, to the right of young.



FIG. 2. EAGLES ONE MONTH OLD.
A snake to the right of nest, on further side of nest.

Although previously very wild he now became as tame as his mate and would mount to the small point of projecting rock, which shows plainly in some photographs, while I stood below watching him. Here he cast a shadow on the south side of the eyrie into which the eaglets hastily scrambled, pressing close up against the rock wall under his tail in their eagerness to enjoy the shade. The eagle, being naturally uneasy, would turn about on his pedestal, and regard first the nestlings and then me with that cruel gaze characteristic of his tribe. Powerful binoculars showed every motion at a height where the camera was useless. After the June rains incomparable contrasts of red and green were here presented, vermilion lava-strewn rocks nestling in verdure, and covered with yellow flowers and vetches, while tall cream-colored soap-weeds swayed under the divides.

No trace of food was visible before the eaglets were hatched, but after their arrival the nest always contained either grouse (*Pediæcetes phasianellus columbianus*), jack-rabbits, cotton-tails, mountain rats, meadowlarks, or snakes. (Plate IV.) Sometimes, indeed, the putrid remains of all these creatures contaminated the air. The fur of the hares was removed, and the birds plucked clean, before the eaglets were allowed to partake of them, but while mammals and snakes were generally decapitated, the birds were seldom thus treated. No carrion was ever taken to the eyrie, although I knew of 80 cattle carcasses round about, and prairie dogs were also disdained. As I never visited the eyrie without finding a Sharp-tailed Grouse the eagles must levy severe toll on this species, more especially in June when the hens are sitting on from 10 to 15 eggs. On the other hand the eagles captured numbers of rattlesnakes. According to eye-witnesses they feint several times at the snake to make it uncoil and seize it just behind the head with one foot, while gripping it further back with the other. The snake is then taken to a tree or rock and the head torn off, which according to one observer is immediately devoured, before the body is deposited in the eyrie. It is possible that the wing is also used as a shield, after the manner of the African Secretary Bird, but, in any case, I doubt if the rattlesnake could bite through the bird's thick feathers. The eagles hunted in the early morning or on cool, cloudy days, one, or both, always shading the young from the sun on hot afternoons.

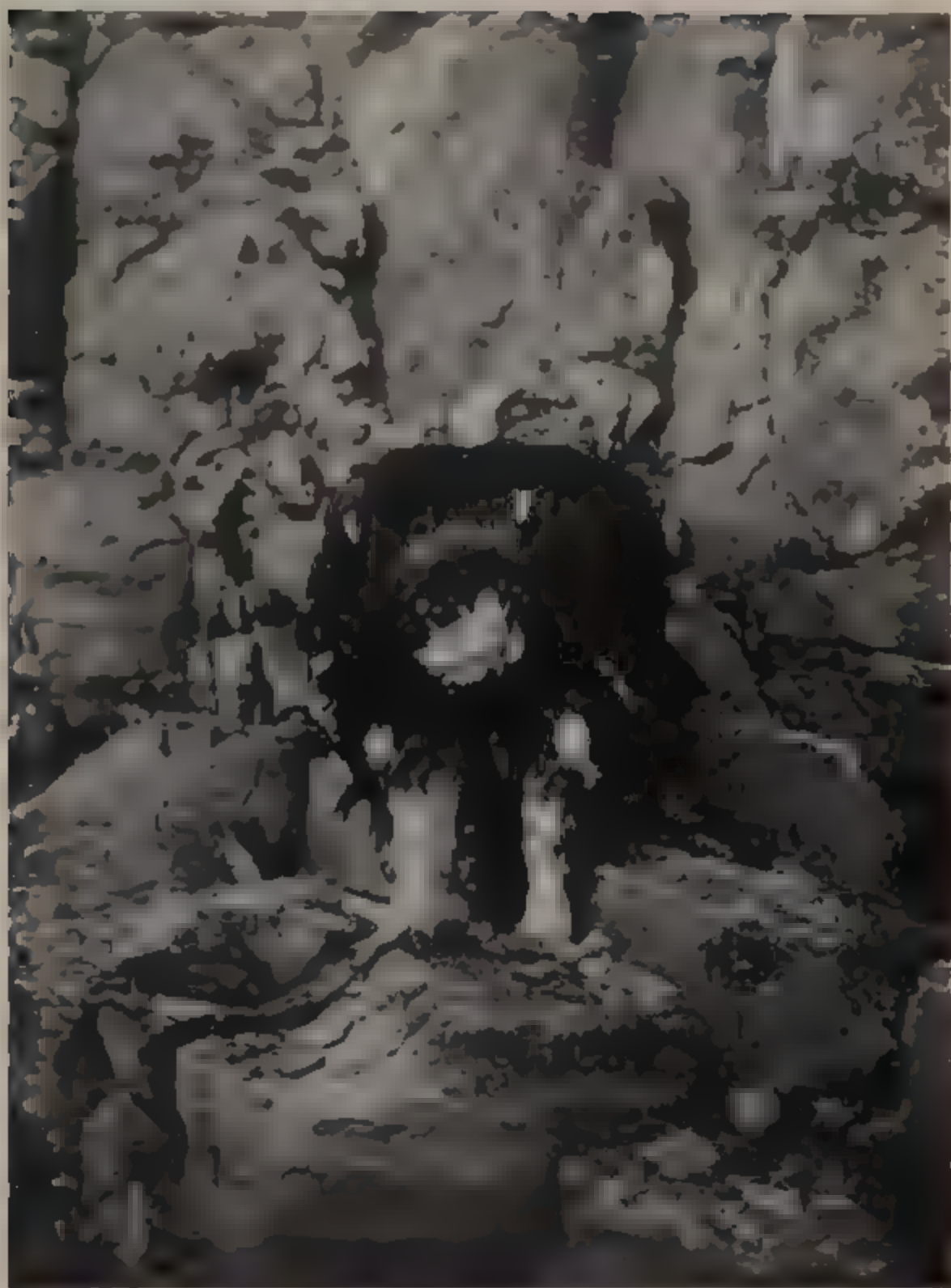
Whether the male or female happened to be frightened from the eyrie by me neither would return if I chanced to be near, and before realizing this fact I wasted hours waiting to see the bird come back, unconscious that the eagle watched for my departure from some lofty pinnacle. At length, however, by searching the badland peaks with my binoculars I discovered the watching bird and the principles of its game.

On the other hand, the parent that happened to be absent on commissariat duty, when I visited the nest, had no scruples about returning to shade the eaglets, and I have known the male to do this before I had ridden 200 yards away, the bird sweeping past to the eyrie with a great rush of wings. When both parents were frightened away I never waited long at the eyrie, believing that the hot sun might kill the eaglets. In keen distress they pressed into the angles of the rock laboriously panting, the water dropping from their mouths, while swarms of flies, attracted by the raw meat odor they exhaled, completed their torment. This determination never to face the sun added to the difficulties of the photographer. (Plate V.)

At first the call of the young for the parents was a piping or whistling on two notes, more like a plover than an eagle, but when they were nearly two months old it became harsh, resembling that of the American Sparrow Hawk. The old birds afforded shade to their young with drooping wings, keeping the breast or tail over them indifferently; but while thus engaged, they had no shade themselves, and they, too, panted with gaping beak which was not becoming to their style of beauty. At a month and eighteen days old, when the male eaglet was still a crouching spiritless object, the female stood boldly in the eyrie and looked something like an adult eagle, as the photograph shows. (Plate VI.) In plumage, as in everything else, she was far in advance of the male, and at two months old (July 8) left the rock to take short flights in the badlands attended by her admiring parents. When tired she perched in a low cedar, at the edge of a ravine, the old birds sitting on the ground beside her. They had now become so accustomed to seeing me as to pay but little attention to my presence. Meanwhile the male eaglet would not leave the rock and did not fly for a week later although hatched at the same time!



EAGLETS IN NEST ONE MONTH AND 25 DAYS OLD
They would not face the sun.



FEMALE EAGLE TWO MONTHS OLD AND ABLE TO FLY

Both eaglets were caught and could be picked up with bare hands, but, while handled a good deal for the purpose of photography, they never acted on the aggressive, as might have been expected. I had previously found fledglings of *Buteo borealis* and *B. swainsoni* equally submissive, and it may be safely assumed that young eagles and buzzards may be handled with impunity for a time after they have flown.

As the female eaglet was too lively a subject for the camera, the male was photographed on my wife's arm, around which a sack had been wrapped to protect it from the talons. The bird's crop, however, was so enormously distended with grouse that a near view would have been most inartistic. At this time the eaglets appeared to be fed entirely upon Sharp-tailed Grouse which were still plucked for them by the parents. No other remains were seen. I should much like to have witnessed the eagles in pursuit of the grouse, but they hunted at such a long distance from home that I had little opportunity of seeing this particular pair take any quarry. My wife saw one of them stoop at, and miss, a jack-rabbit, which was loping along only about 100 yards distant, on which occasion the intended victim sought refuge in a prairie dog hole. Whereupon the eagle took up its station at the hole waiting for the hare to come out. It may be interesting here to relate a parallel incident in Scotland.

Within the last few years, the Golden Eagle has reëstablished itself in the heart of the deer forest on the Island of Jura, Inner Hebrides, where there are no white hares, and observation has shown that at least one resident pair of eagles feed largely on grouse. My brother has frequently described an eagle 'hawking' grouse just as a Peregrine will do. On one occasion the royal bird, in full chase of a grouse, passed within a few feet of my brother's head, and on another occasion the eagle was surprised sitting on a stone in the heather at about 30 yards distance, when it flew unwillingly away.

Shortly afterwards my brother almost trod upon a cock grouse, lying like a stone in deep heather close to where the eagle had been waiting, and came to the conclusion that the eagle, having hunted the grouse into this thick covert, was waiting, like a cat at a mouse hole, for the quarry to reappear. Owing to the panic

caused by the continued presence of the eagles among the winged game, the grouse gradually left the ground, and a good grouse moor was spoiled in consequence. In this country a similar flight of eagles after a Sage Grouse is recorded by Mr. Ridgway.¹ "A pair — the female leading — were observed to give chase to a sage hen, chasing her on the wing until the fugitive dropped down to the ground from exhaustion, where she was picked up by the foremost of the eagles." There is some evidence that, in Scotland, eagles have struck down both grouse and ptarmigan on the wing, but at present absolute confirmation is lacking. In his letter to 'Country Life' (London), mentioned above, Mr. C. J. Cornish has raised the question of the carrying power of eagles.

Personally I have never known an eagle to carry anything heavier than a seven pound jack-rabbit and would think eighteen pounds (the extreme weight of a jack-rabbit or a Scotch brown hare), to be the extent of the largest eagle's capacity. It follows, therefore, that the lambs taken are very small. Thirty years ago eagles were extremely common on the west coast of Scotland, and during the breeding season each pair taxed the sheep farmer from one to two lambs a day according as game was plentiful or scarce. A war of extermination was waged against them and my uncle, a sheep farmer in Skye, killed to his own gun during his life time 90 eagles in defence of his lambs.

It is gratifying to know that the collapse of sheep-farming in the Scottish Highlands as a profitable industry, and the consequent abandonment to deer of large areas formerly grazed by sheep, has given the Golden Eagle as a species a new lease of life, these birds being now as jealously preserved by owners and lessees of deer forests as they were once ruthlessly destroyed by the sheep-farmers on the same ground.

As regards the changes of plumage in Golden Eagles, the nestlings hatched 'downy white' and remained in this stage for a month, when they were about the size of a Herring Gull, and black feathers appeared in the wings and tail. At six weeks old they had changed almost completely to a black brown, while at

¹ A History of North American Birds, by Baird, Brewer, and Ridgway. Land Birds, Vol. III, p. 319, 1874.

two months they were about three parts grown. At this time a description of their plumage is as follows. Whole body and tail darkest chocolate brown, excepting the fluffy white crop and chin, the latter brown streaked. Legs dull white, streaked with pale brown in the male, and tawny in the female. Iris dark hazel; bill bluish slate; cere and angle of mouth yellow; claws black.

In 1903 observations could only be made on the female eaglet after it had moulted, as the male was killed by a shepherd before it could fly, as above stated. In this bird, which lingered about my ranch until April, the basal two thirds of the tail became white, and she showed a great deal of white under the primaries and elsewhere when flying, which was otherwise unobservable.

Her mother was, apparently, but two years old in the spring of 1903, and while, in 1904, I often approached within a yard I saw no concealed white, as she flew off, which seems to show that this is lost after the second moult. On the other hand, as the white band encompasses nearly half of her tail, I am led to suppose that maturity is reached at about five years but would be glad to know the real facts. The male, which was seen in immature plumage for two years, moulted into full adult dress in 1903, and being more than twice the age of his mate eclipses her in size and appearance although the reverse is usually the case. Absence of white anywhere on the body easily distinguishes him, the entire tail looking black, although it may be marbled with brown, and while the crown and nape (the cowl), are really cream color they look white at a distance in marked contrast to black cheeks and chin.

In the early nineties eagles were very common in Montana and very tame, but became almost exterminated as a result of the high bounties placed on wolves. At this period eastern Montana swarmed with professional wolfers, occupied in destroying wolves by poison and otherwise so that no one could keep dogs at all, and the game, as well as the eagle, was almost wiped out.

A wolfer would "string out a line of baits," as he called it, from one creek to another; which simply meant that deer and antelope were shot down wholesale in a line across country, the carcasses filled with strychnine, and the poisoned baits scattered around. When the weather became too cold for strychnine to

work effectually, the wolfers started trapping, and great numbers of Golden Eagles, as also Magpies, fell victims to the process which by their flapping prevented the suspicious wolves from approaching the bait. I was constantly with trappers and know that their average catch was from three to six eagles apiece every winter. Sometimes an eagle would leave a toe in the trap, but more often they were caught by both legs — springing a second trap in the struggle to free the imprisoned leg from the first. Carcasses of range cattle, which succumbed in hundreds to blizzards and starvation, provided the eagles with an ample supply of beef, but their preference for the venison with which the traps were baited proved their destruction — the violent struggles of the trapped victim making even a quick release futile. Magpies were entirely exterminated on the south side of the Yellowstone, and, although eagles just survived, fifty or sixty must have perished annually in my locality alone from poison and traps combined. Had not, indeed, the appropriation for bounties become exhausted the last named birds could hardly have escaped total extinction; but as the wolfers were latterly paid in scrip, which they cashed at a loss, they became disheartened, and the eagles were respited. It may be mentioned that during 1897, 22,082 coyotes and 6,112 wolves were killed in the State, and in November, 1898, bounty claims amounting to \$70,000 were not only still unpaid, but were continually increasing. A fresh impetus was given to wolfers in 1901 and 1902, by the uniform bounty of five dollars each fixed on wolves and coyotes, and I doubt if there are now half-a-dozen pairs of eagles within a 50 mile radius of Terry, where once they were common. There is no creature more easy to trap than an eagle, which feeds on carrion as readily as a vulture. In the winter of 1893 when I was setting traps around a dead deer which had been visited the previous evening by numerous suspicious wolves, an eagle was observed to watch the proceedings from a pine close by, and the same bird alighted subsequently to its doom. In the Highlands of Scotland a common and favorite bait with the preserver of game was a dead cat, the success of which may possibly be due to the fact that it resembles a mountain hare, the principal food of the mountain-dwelling eagle. When staying with my brother

in Scotland during May, 1889, four Golden Eagles were caught on an adjoining estate by means of a single dead cat.

The total extermination of eagles would be to my mind an indescribable calamity, as wherever wild regions are found, either in the Rocky Mountains, the Scottish Highlands, or the badlands, the appearance of an eagle puts the finishing touch to the grandest and most impressive scene.

NOTES CONCERNING CERTAIN BIRDS OF LONG ISLAND, N. Y.

BY WILLIAM C. BRAISLIN, M. D.

IN THE accompanying notes data concerning some of the common gulls of our coast are presented for the purpose of emphasizing the favorable results, evident even to the casual observer, which have been produced by the passage of laws of greater stringency for the better protection of these birds. The enactment of these, together with the conviction and fining of a few flagrant offenders through the activity of the Chairman of the National Association of Audubon Societies, Mr. William Dutcher, have been of evident benefit to birds, in that gulls have been seen more or less commonly the past summer through, along the whole south shore of the island.

The passage of the law preventing spring shooting of ducks seems likewise to have been beneficial. Sportsmen and baymen are unanimous in their opinion that ducks have been more abundant in the Great South Bay this autumn than usual. It is possible that other factors have combined with the law to bring about this immense increase in the number of ducks this autumn. At any rate the facts are a strong argument against the repeal of this law, which latter many short-sighted Long Islanders desire. Brief references to a few other species are given for reasons which are evident in the text.

Larus kumlieni. Kumlien's Gull is herewith definitely recorded for the first time as a bird of Long Island. Dr. Jonathan Dwight, Jr., whose paper on the plumages and moults of North American Gulls is, we believe, in press, has examined the specimen which I recorded in 'The Auk,' April, 1899, p. 190, as "*Larus leucopterus* (or *kumlieni*).\" Dr. Dwight's investigations, which will hereafter enable one to identify the immature as well as the adults of *L. leucopterus* and *L. kumlieni*, have determined the differential diagnosis of the two immature birds heretofore impossible. The color of the shafts of the primaries are, he finds, invariably distinctive.

Larus marinus. The first Great Black-backed Gull observed this autumn at the western end of Long Island was seen by Mr. Robt. L. Peavey, on Nov. 20, 1904, at Rockaway. The earliest fall record of this bird for this locality which the writer knows is November 3. Both these dates are considered early, the birds rarely occurring here in abundance much before Christmas. The northward departure occurs correspondingly early, March 13 being the date on which the last bird has been seen.

Larus argentatus. The common Herring Gull has been rather common the summer through for the past three or four years from Rockaway Beach to Montauk. Before this, one saw them regularly in Peconic Bay and but rarely elsewhere, in summer. They do not nest on Long Island but the increasing number of 'left overs,' as the baymen term them, is taken to indicate their increasing numbers elsewhere, which we regard as due largely to the efforts of the Audubon Societies, through their Treasurer, to extend absolute protection to them along the whole Atlantic coast, especially during the breeding season.

Larus delawarensis. The Ring-billed Gull is not uncommon in our locality in summer. At least 50 were observed July 4, 1902, at Freeport. One killed there on Sept. 5, 1901, was in an advanced stage of moult, the throat being nearly bare. Immature and adult Ring-billed Gulls pass along this part of the coast in large numbers in October, when they are also common in our harbors. The last one was noted on November 17. The writer has no record of this bird in winter for this locality.

Larus atricilla. The only gull for which evidence still exists to support a claim for it as a breeding species on Long Island,

has as yet shown no marked evidence of increased numbers. One was seen at Rockaway Beach as late as Sept. 2, 1904.

Aythya americana, Aythya vallisneria, Aythya marila nearctica. During the last week of August, 1904, Scaup Ducks and Red-heads were present in the South Bay opposite Speonk and the vicinity, the larger number being the first. Both these have continued to be abundant during October and November. Gunners, quite a number of whom have been questioned by the writer, report them more common than they remember them to have been before.

During October, 1904, Mr. J. A. Fonda saw in the eastern end of the Great South Bay a flock of six Canvas-backs, two of which were secured, and later a single Canvas-back was killed from a flock of Scaup Ducks.

Among other ducks more common here in October than usual were *Anas boschas*, *Dafila acuta* and *Erismatura jamaicensis*.

Limosa hemastica and **Tryngites subruficollis.** Two specimens of the Hudsonian Godwit and one Buff-breasted Sandpiper were collected by Mr. Robt. L. Peavey of Brooklyn, the former (♀ and ♂) on Aug. 30, 1903, and the latter Sept. 11, 1904, all at Rockaway Beach. The Buff-breasted Sandpiper was flying along the outer beach.

Petrochelidon lunifrons. According to the personal testimony of Mr. W. W. Worthington the Cliff Swallow was formerly rather common locally on Long Island. As a breeding bird it is, now, certainly rare. It seems to migrate along the ocean coasts much less abundantly than other species of swallows. Though often looked for, the writer only obtained his first Long Island specimen Sept. 5, 1904, at Rockaway Beach.

Hirundo erythrogastra. An albino Barn Swallow was shot by the writer at Centre Moriches, L. I., Aug. 19, 1904. Hundreds of this species and *Tachycineta bicolor* were at this season passing westerly on their day-time migration and this white bird was seen approaching over the salt meadows, conspicuous from its color. It was supposed to be an albino before it came to bag but the species was not determined until then. The chin and throat and portions of the remiges margining the usual white spots on the tail are washed with buffy; elsewhere the bird is pure creamy white.

A HITHERTO UNPUBLISHED LETTER OF
JOHN JAMES AUDUBON.

BY RUTHVEN DEANE.

It is extremely interesting to read any of Audubon's original letters, particularly those touching upon certain birds or subjects which we are familiar with by frequent reading of his works. The following short letter written on the completion of his drawing of the Golden Eagle (*Aquila chrysaëtos*) has but recently come into possession of his granddaughter, Miss M. R. Audubon, and through her kindness I am able to present it here. In his 'Ornithological Biography' Vol. II, in the article on the Golden Eagle, Audubon writes: "In the early part of February 1833, while at Boston in Massachusetts, I chanced to call on Mr. Greenwood,¹ the proprietor of the Museum of that city, who informed me that he had purchased a very fine Eagle, the name of which he was desirous of knowing. . . . I recognised it at once as belonging to the species whose habits I have here to describe, and I determined to obtain possession of it, . . . I sat up nearly the whole of another night to outline him, and worked so constantly at the drawing, that it nearly cost me my life, I was suddenly seized with a spasmodic affection, that much alarmed my family, and completely prostrated me for some days; but thanks to my heavenly Preserver, and the immediate and unremitting attention of my most worthy friends Drs. Parkman,² Shattuck,³

¹ Ethan A. Greenwood bought out the management in a Museum, January 1, 1825, and located on Court St., Boston. This was known as the New England Museum and was at that time considered valuable and was very popular. Three years previous to this date Greenwood had bought the larger part of a collection which had been sold at auction by one Wood. In 1839 the assignees of Greenwood (N. E. Museum) sold the collection to Moses Kimball for his Boston Museum, which was opened in 1841 on the corner of Tremont and Bromfield Sts., and in 1846 was moved to the new museum building near Court St. This Museum afterwards became celebrated as a theatre, a portion of it being still reserved for a natural history collection, where, in 1900, the types of many of Wilson's birds were found.

² Dr. George Parkman, born 1791, died 1849.

³ Dr. George Cheyne Shattuck, born 1783, died 1854.

and Warren¹ I was soon restored to health and enabled to pursue my labors. The drawing of this Eagle took me fourteen days, and I had never before labored so incessantly excepting at that of the Wild Turkey."

Boston.

Feb. 5th 1833.

My dear friends

I am just now quite fatigued by the drawing of a Golden Eagle which although it will make a splendid plate has cost me sixty hours of the severest labor I have experienced since I drew the Wild Turkey. You shall I hope see it through the care of Mr. Gordon.² Do not ever ship any more Nos. to this port unless on vessels that are intended as packets. The Charlotte has not come and it will be a rubber if I can get enough cash to establish our going to Labrador until she does. Push Jos. B. Kidd³ of Edinburgh if he *can* be pushed to paint copies of our drawings. I look on that series as of great importance to us all. Havells' blunder in not having the numbers and paper on board the New York in time, is one which, with him I never can correct. If you can do more than I on this score of punctuality I will be gratified. I shall proceed to New York as soon as the weather moderates, on Sunday last the thermom. was 12 below zero. The work is now I am assured free of duty. When you write give a word of recollection to Dr. Parkman who is a most desirable and worthy friend.

God bless you, forever yours

J. J. Audubon.

¹ Dr. John Collins Warren, born 1778, died 1856. At his death was President of the Boston Society of Natural History.

² Alexander Gordon. A Scotchman, who married Ann Bakewell, youngest sister of Mrs. John James Audubon.

³ Joseph Bartholomew Kidd, born 1808, died 1889. At the age of 23 years he arranged with Audubon to copy some of his birds, which were to be sold and the proceeds divided.

JOHN JAMES ABERT, TO JOHN JAMES AUDUBON.

(Hitherto unpublished letters.)

BY RUTHVEN DEANE.

THE following letters written by John James Abert are based upon information and specimens furnished by his son, Lieut. James William Abert, who in 1848 wrote his 'Report of an examination of New Mexico in the years 1846-7.' Lieut. Abert was at that time an officer of Topographical Engineers.

In each of these letters reference is made to a partridge, then unknown to them, which in the Report of 1848, had been identified as the Scaled Partridge (*Callipepla squamata*). While this species was first described by Vigors in 1830 from specimens sent from old Mexico, those collected by Lieut. Abert were the first records for the United States. The only quotation from Abert's Report referring to this partridge which I find, is by Cassin,¹ but these letters are particularly interesting as they antedate any published records of the Scaled Partridge for our fauna. Mr. Ridgway writes me that none of these specimens found their way into the Smithsonian collection, but Mr. Witmer Stone writes, "I am happy to say we have one of the Abert Scaled Partridges in the Philadelphia Academy (No. 24331, December, 1846, New Mexico); it is mounted and in good shape." These letters are copied "verbatim, literatim et punctuatim" and I am under many obligations to Miss M. Eliza Audubon for the privilege of publishing them.

Dear Sir :

My son Lieut. A.² has some taste for Natural History. He has just returned from Santa Fe, having been on General Kearney's³ expedition. He had learned to prepare bird skins & had prepared many, but unfortunately during a long & Severe illness his Skins and arsenick were lost — when he recovered he prepared a few

¹ Illustrations of the Birds of California, Texas, Oregon, British and Russian America. Philadelphia, 1856. p. 129.

² James William Abert, born November 18, 1820; died August 10, 1897.

³ General Stephen Watts Kearney, born August 30, 1794; died October 31, 1848.

Skins with corn-meal and has brought them in, in good condition, what should now be done with them. Among these skins are some of a quail or Partridge¹ which I do not find among your birds of America. It is about the size of our quail, but totally different in color, being ash or lead color. Also the skin of a lark,² not larger than our house sparrow and brown. Also 3 or 4 Skins of what I think (but I have not yet compared) is the Shafted Woodpecker,³ a Skin of the Meadow Lark,⁴ differing slightly in plumage from ours, but totally different in its notes. Some Skins also of (probably) the ultra-marine Jay.⁵

He says our Prairie Dog (a marmot) does not hybernate but is out all winter as lively and as fast as on any Summer day. He has a skin of one. Also a skin of the black tailed hare, and of a rabbit, the latter much smaller than our rabbit, and of a Skunk so differently marked from any that I have ever seen, or have ever seen described, that there may be something new in it. The ears of his hare, differ from those of the drawing you once showed me, being much wider, rather leaf shaped. May not these add something to our contributions to Science.

Yours

J. J. Abert.⁶

J. J. Audubon Esq.

April 7 '47

¹ In the Report of 1848, Lieut. Abert writes, "December 9, 1846. Spent the morning hunting quails in the vicinity of the 'mesa' below; procured a female '*ortix squamosa*.' December 12, 1846. I obtained five beautiful specimens of the '*ortix squamosa*,' as the arsenic that we had obtained in St. Louis has been taken to California I was obliged to fill the skins with corn meal."

² Referable to one of several forms of the Shore Lark. In the Report of 1848 Lieut. Abert frequently refers to the large flocks of *Alauda alpestris*.

³ Undoubtedly the Red-shafted Woodpecker (*Colaptes cafer*). In the Report of 1848, under date of December 8, 1846, is given: "We procured several specimens of the red-winged flicker *picus Mexicanus*."

⁴ *Sturnella neglecta*. In the Report of 1848, under date of December 5, 1846, is given: "On my return I got five specimens of the Mexican Meadow lark '*Sturnella neglecta*'."

⁵ Probably referable to Woodhouse's Jay (*Aphelocoma woodhouseii*).

⁶ John James Abert, born September 17, 1788; died September 27, 1863. Became Colonel in command of topographical engineers in 1838, one of the organizers of the National Institute of Science, which subsequently merged into the Smithsonian Institution.

Dear Sir.

I have sent you a copy of my son's first expedition to the Rocky Mountains.¹ The report of his second, from which he has just returned is, of course, not yet made out. I shall talk to him about the subjects of your letter.

It was after an examination of your small edition of the birds of America that I considered the Quail a new one. There is certainly nothing like it in that work, unless it be out of place in the book and in that way has escaped my examination. A person of some knowledge in these matters, who has seen the skins, calls it a new bird, but there is no one of sufficient authority to depend upon.

Yours truly

J. J. Abert

J. J. Audubon Esq.

12 April '47

Dear Sir

There are two birds brought in by my son which we have not yet been able to find described by any one, one is a Quail and the other a *Sialia*.² Our examination in reference to the latter, have not yet been very thorough. It was only yesterday that the skins had got through the thorough preparation you advised in order to preserve them. His mamalian skins are now going through a similar process. He says he will send them on for your inspection when cured and when an opportunity shall offer, the Skunk is a singular skin in its markings, and differing from anything that I have seen.

Yours

J. J. Abert.

27 April '47.

J. J. Audubon Esq.

¹ Notes on a Military Reconnoissance, from Fort Leavenworth in Missouri, to San Diego, in California. By W. H. Emery, 1848. Appendix No. 6. Notes by Lieutenant J. W. Abert, pp. 386-405.

² In the Report of 1848, under date of December 7, 1846, Lieut. Abert writes: "During the morning I was busily engaged in skinning birds, we had eight Mexican blue birds '*sialia occidentalis*'. They differ from the blue birds of the United States in having the back brown and the wings tipped with black and are more delicate in their contour."

Dear Sir

The *Sialia* brought in by Lt. A. is, I think, the "Western Blue Bird", but we cannot yet identify the partridge with anything in your book. It is decidedly a dove colored bird, slightly tinged with brown, a longer tail than our quail and full as large. He saw many of them and brought in six skins. Peale¹ is disposed to think it new. He saw the skins in the hands of Pollard,² who was employed to put them up. I have advised Lt. A. to describe this bird without delay.

Yrs.

J. J. Abert.

28 April '47.

J. J. Audubon Esq.

SOME NEW AND RARE BIRD RECORDS FOR MICHIGAN.

BY NORMAN A. WOOD.

[University Museum, University of Michigan.]

DURING the summer of 1904 these records were made by Messrs. A. G. Ruthven, Otto McCreary, W. A. Maclean, Max M. Peet and the writer, while members of the Museum Expedition to the Porcupine Mountains and Isle Royale. A detailed report on the ornithological results will be published later.

Prof. W. B. Barrows of the Michigan Agricultural College is preparing a volume on the birds of Michigan, which he expects to publish at an early date. At his suggestion the following records are published in advance of the regular report, in order that they may be incorporated in his forthcoming volume.

No attempt will be made to prove that all of these are "breed-

¹ Titian Ramsey Peale, born 1800, died March 13, 1885. He accompanied the South Sea Exploring Expedition in 1838-42, under Lieut. Charles Wilkes, as Naturalist.

² Pollard. An assistant in taxidermical work under Titian R. Peale.

ing records." The facts as observed by the members of the party will be presented and the reader can draw his own conclusions. It is well understood that the presence of adult birds, even when accompanied by their young, is not positive proof of the breeding of the species in that locality, except early in the breeding season. In order that we may fully understand the conditions which prevail in the region worked it will be best to locate the Porcupine Mountains on a map of Michigan. They are situated in Ontonagon County on the south shore of Lake Superior. Across the lake to Grand Marais, Minnesota, it is about 80 miles; Isle Royale is 67 miles north. To cross the lake south from these points would be a long flight for young birds. It is possible that the birds migrated here by land, either around the western end of Lake Superior, or from Keweenaw Point, 100 miles to the northeast. There is also the possibility of a migration, partly by land, from the Minnesota shore opposite the Apostle Islands; where by crossing 40 miles of water, a rest could be had before another flight of about 40 miles due east over the lake, to the Porcupines. But to my mind none of these possibilities account for the presence of such northern forms as the Connecticut Warbler, Olive-backed Thrush, Pigeon Hawk, and the White-winged Crossbill, all of which I believe bred in the Porcupine Mountains during the past summer of 1904.

Given the presence of the young bird with the adult, the time of the year at which they are seen does not so strongly substantiate their breeding in a certain locality, as does the age and condition of the young. I have tried to make plain in the list, the data bearing on this point. I have excluded from the list birds that are early migrants like the waders, of which we took the following at the Porcupine Mountains: Wilson's Snipe July 19, Solitary Sandpiper July 18 (we saw families of this bird on Carp River at this date), Least Sandpiper July 21, and Yellow-legs August 3.

Isle Royale is about 15 miles from the Canadian shore and this distance would prevent migration of northern species until the young were old and strong enough to make the flight. All unfledged young seen here were surely bred on the Isle. The presence also, in the summer, of the Sharp-tailed Grouse on the island proves to me that they breed here. Additional authority

for this is the statement of residents and hunters who told us of them.

The determination of several doubtful forms was made by Mr. H. C. Oberholser, for which we are indebted to Mr. Robert Ridgway of the Smithsonian Institution and to Dr. C. Hart Merriam, Chief of the U. S. Biological Survey.

1. *Pediocetes phasianellus* (?). NORTHERN SHARP-TAILED GROUSE. — Siskowit Bay, Isle Royale, Aug. 29. A family of this species was seen at close range by Ruthven. The residents told me that the "Prairie Chicken" lived at Siskowit Bay throughout the year. The large clearing (about 500 acres) near the old mines, seems to furnish the favorable conditions for them.

2. *Accipiter velox*. SHARP-SHINNED HAWK. — Porcupine Mountains, July 13. Adults and young were seen nearly every day of our stay. Isle Royale, Aug. 16. Common during our stay on the Isle.

3. *Falco columbarius*. PIGEON HAWK. — Porcupine Mountains, July 24. An adult and three young were seen, and two young taken by Maclean. Isle Royale, Aug. 23. Several seen and three taken.

4. *Asio magellanicus occidentalis*. GREAT HORNED OWL. — Porcupine Mountains, July 24. An adult and two young were seen and one of the young birds was taken by Maclean. Isle Royale, Aug. 26. A family of four was seen and three of them were taken by McCreary.

5. *Dryobates villosus leucomelas*. NORTHERN HAIRY WOODPECKER. — Isle Royale, Aug. 4 to Sept. 4, several were seen and two taken.

6. *Perisoreus canadensis*. CANADA JAY. — Porcupine Mountains, Aug. 7. One seen near Little Carp Lake by Peet. Washington Harbor, Isle Royale, Aug. 18 to Sept. 4. Common. A resident said they were present throughout the year.

7. *Agelaius phoeniceus fortis*. THICK-BILLED REDWING. — Washington Harbor, Isle Royale, Aug. 18 to Aug. 29. Two males and two females were taken.

8. *Loxia curvirostra minor*. AMERICAN CROSSBILL. — Porcupine Mountains, Aug. 5. Small flocks or families were seen in the tamaracks and several were taken.

9. *Loxia leucoptera*. WHITE-WINGED CROSSBILL. — Porcupine Mountains, Aug. 5. Adult male and three females were taken in the tamarack swamp near Carp River by McCreary. The crops of these, as well as of the American Crossbill, were full of the seeds of the tamarack. Washington Harbor, Isle Royale, Aug. 18 to Aug. 30. Several small flocks were seen.

10. *Spinus pinus*. PINE SISKIN. — Porcupine Mountains, July 15 to Aug. 14. Common and several were taken. I saw a female, Aug. 4, pick up some hairs near the door of the camp and fly to the woods. The testes of the males taken also indicated the breeding season. Washington Harbor, Isle Royale, Aug. 18 to Sept. 5. Common.

11. *Vireo solitarius*. BLUE-HEADED VIREO.—Porcupine Mountains, Aug. 5. Adult male and female were taken by McCreary. They were also seen here on July 27.

12. *Dendroica caerulescens*. BLACK-THROATED BLUE WARBLER.—Porcupine Mountains, July 17. A pair was found whose actions indicated a nest near by. July 20, young in the down were taken and many seen, too young to fly. Washington Harbor, Isle Royale, Aug. 18 to Sept. 4. Common.

13. *Dendroica coronata*. MYRTLE WARBLER.—Porcupine Mountains, July 16. Adults with young seen by McCreary. Washington Harbor, Isle Royale, Aug. 20 to Sept. 3. Common. An adult female and a young male were taken.

14. *Dendroica blackburniae*. BLACKBURNIAN WARBLER.—Porcupine Mountains, July 14 to Aug. 1. An adult female, while feeding young not able to fly, was taken with the young by Peet. Several adult birds with families were seen near camp.

15. *Dendroica vigorsii*. PINE-CREEPING WARBLER.—Porcupine Mountains, July 19. McCreary saw adults carrying food to young in the top of a pine, at the edge of a cliff.

16. *Seiurus noveboracensis notabilis*. GRINNELL'S WATER THRUSH.—Washington Harbor, Isle Royale, Aug. 20 to Sept. 1. An adult female taken, Aug. 24. An adult male taken Aug. 26. In a cedar swamp I heard one singing a low sweet song Sept. 1.

17. *Geothlypis agilis*. CONNECTICUT WARBLER.—Porcupine Mountains, July 27. An adult female and young of the year were taken by Maclean. This female had the large bare space on abdomen and the thick tough skin so characteristic of breeding birds. A family of four was seen in a swampy clearing near the Lake Superior shore by McCreary.

18. *Geothlypis philadelphia*. MOURNING WARBLER.—Porcupine Mountains, July 15. Adult female and two of her young were taken by Peet. Adults were seen near camp several times feeding young unable to fly.

19. *Wilsonia canadensis*. CANADIAN WARBLER.—Porcupine Mountains, July 15. An adult was seen with an insect in its bill. This bird acted as though its young were near by. Aug. 7, in a cedar swamp near the Lake Superior shore, an adult female was observed whose actions indicated young near at hand.

20. *Hylocichla ustulata swainsonii*. OLIVE-BACKED THRUSH.—Porcupine Mountains, July 26. A nest with two eggs was found by McCreary. This nest was built on a small hemlock (about 10 feet from the ground) and composed of leaves, strips of bark and grasses. The eggs were a bluish green with cinnamon brown spots sprinkled over them. An adult female was taken July 22 which had the large bare space on the abdomen and the thick skin found on breeding birds. A young unfledged bird was taken July 29. This species was common and was frequently seen and heard singing by McCreary.



Brown Creeper with food in its bill, backing down toward the nest in a 'zig-zag' line from a few inches higher up the tree-trunk where it had been clinging motionless for several minutes.

NESTING HABITS OF THE BROWN CREEPER.
AS OBSERVED IN PLYMOUTH COUNTY,
MASSACHUSETTS, WITH DESCRIPTION OF A NEST FROM
NORTH SCITUATE.¹

BY ARTHUR P. CHADBOURNE, M. D.

Plates VI-IX.

EVER since 1896, when I first spoke of the Brown Creeper (*Certhia familiaris americana*) as undoubtedly breeding in one of the white cedar swamps so common throughout Plymouth County, Mass.,² I have found these birds each summer during May or June with the single exception of 1899, when I was unable to look for them until July. My efforts to find the nest, however, were unsuccessful until May, 1900, when I discovered one at North Scituate, Mass., only a short distance from what is not inappropriately called "the shore of the swamp." The swamp in question is large and cut up into a number of narrow strips, each not unlike a yard stick in shape, and having different owners; consequently the growth varies on each strip according to the time at which the timber was last cut off. A few of the lots are still covered with old cedar; but the greater part is large second-growth, and mixed hardwood; in other cases, almost clear cedar, from fifteen to thirty-five feet in height. Scattered about in the hardwood, and, to a less extent in the cedar, are numerous white pines, hemlocks, and here and there yellow, or, as they are locally called, "swamp pines." It was on the southern edge of one of these narrow strips, which had been cut "clean" two years before, that I found the present nest. Deep mud and water had made the place almost inaccessible until last year (1899), when the water was more or less drained off by a ditch. Around this clearing the growth is chiefly cedar and hemlock, with a few old white

¹ This was written, to a large extent, in 1900. The article, by Messrs. Kennard and McKechnie which also appears in this number of 'The Auk,' covers the published accounts of the nesting of the Creeper in the southern part of its range, and I have omitted, therefore, what I had written on this subject.

² Cf. Auk, Vol. XIII, 1896, p. 346.

pinus to the south; and on the other sides more or less cedar and mixed second-growth hardwood. On the southern edge of this cleared strip was an old wind-shaken white cedar¹ which, with a few of its fellows and half a dozen hemlocks and white pines, were the sole remnants of the large old timber which had formerly covered the clearing. Beneath these old trees, and throughout the swamp was the usual undergrowth of ferns, thick sphagnum moss, mountain laurel bushes, black alder, etc.; while beneath, the black mud and water was bridged by the roots, and decaying stumps of dead trees, and even in midsummer the air was damp and not unlike the mossy northern woods where the Creepers and other northern birds are habitually found in the nesting season.

The morning of May 11, 1900, the day of the so-called "May freeze," I started a Creeper from the ground under a clump of cinnamon ferns (*Osmunda cinnamomea*), where she was gathering the soft yellow down from the young fronds. The bird quickly flew to the trunk of the nest tree, hesitated a moment, then with a horizontal run sideways and most decidedly crablike, she disappeared with her load in the upper part of a rift which extended completely through the trunk of the tree for a distance of five feet or more from the base, as is clearly shown in the photograph (Plate VI). It took the Creeper a long time to arrange the down to her satisfaction, and her mate three times brought her food while she was hidden within the soft materials of the nest. In about fifteen minutes she flew out and began zigzagging up, and occasionally backed down, the trunk of a neighboring tree, looking for insects. It was fully thirty minutes before she returned to the nest, but during the latter part of the time I had lost sight of her, and when she returned it was with another load of fern-down. The crack, or rift, near the top of which the nest was placed, extended completely through the tree trunk from northeast to southwest, and at the level of the top of the nest was about eight inches in width from side to side; while the space

¹ When a swamp has been cut off the trees which border it are exposed to the northeast storms, and many of them, either blown down or partly uprooted, lean against their fellows.



FIG. 1. BROWN CREEPER, QUIETLY WAITING AT THE SAME HEIGHT AS THE 'PEAK OF THE GABLE'



FIG. 2. BROWN CREEPER TAKING THE HORIZONTAL RUN SIDEWAYS TO THE PEAK OF THE OUTER NEST-WALL.



WIND SHAKEN NESTING TREE AND ITS SURROUNDINGS

between the two walls was, roughly, four inches. The framework of the nest did not extend quite to the edge of the trunk, but completely filled the center. The side walls rose in two peaks several inches above the nest proper and had a sharp pitch like an inverted V, the outside being almost vertical, though on the inside the slope down to the nest itself was less steep. The twigs and pieces of bark which formed the outside wall were laid regularly like thatch, being held in place by a few cross loops of thin cedar bark; but on the inside there seemed to be no regular arrangement. On the east there was just enough space above to allow the bird to slip in sideways between the two parts of the tree trunk and then back down into the hollow where the eggs were. This she could do without turning; but occasionally she entered through the southwest side, or gable, and there being very little space here, she usually turned somewhat before entering the cleft and came *down* the trunk, *head first, tail last*, regardless of ornithological rules, which are binding upon all woodpeckers, creepers, and the like. While thus "standing on her head," she seemed to move as surely and easily as in the more natural position.

It was several days after I saw the bird carrying nesting material before I thought it was safe for me to inspect the contents of the nest. On looking in no eggs were to be seen, only a mass of down fluffed like a feather bed, but as, on May 22, there were four open bills belonging to as many young creepers, protruding from the down, it is evident that there must have been four, perhaps five or six eggs in the set, although I cannot say that I ever had a glimpse of any of them. The young were fed by both of the birds, who, I think, seldom extended their search beyond the circle of a couple of rods in width, which included only ten trees, and I never saw them visit the piles of fallen tree trunks and unbarked logs which were scattered throughout the clearing and must have contained countless numbers of borers, judging from the amount of sawdust about, and the rasping noise of the larvæ. Both birds fed the young, and occasionally each other as well, for though it was impossible to distinguish the male from the female, yet both individuals were seen feeding and also being fed. Whether incubation was shared between the male and the female,

I cannot say with certainty; nor am I sure that the peculiar wheezy little song was made only by the male. It was so slight and feeble that it could not be heard more than a few feet away, and shows how easily the birds might be overlooked in the breeding season even when one has penetrated to their almost inaccessible haunts. The clump of a dozen or more old trees above referred to, evidently contained an abundant supply of food for both old and young, and during one whole afternoon neither bird left these few old trees, nor was more than three or four minutes' search ever necessary in order to find a suitable morsel for the young. Considerable time was spent by one or both birds hanging motionless to the trunk of some large tree, and not even the familiar *screech* was heard, the birds being perfectly silent. When coming from the nest the bird usually carried a bit of excrement and dropped it a short distance away.

Unfortunately, I was unable to visit the nest between June 4 and June 6, and on the latter date the nest was empty and no trace of old or young could be found. On July 15, Creepers were again seen near the nesting tree, but, of course, they may not have been the former occupants. I hoped the birds would return to their old home the next season and, in order to keep everything unchanged, wire guys were run from the leaning tree to brace it against the winter's storms. But since 1900 the tree has been unoccupied, nor have I seen Creepers during the breeding season in that particular part of the swamp. This may be due to the growth along the south of the nesting tree having been largely cut off for firewood, as has been the case with many of the swamp lots which in 1900, were covered with a dense growth of white cedar.

That this nest was not exceptional, and that the Brown Creeper regularly, though locally, breeds in similar situations, is shown by the fact that, in 1896, 1897, and 1898, I saw Brown Creepers in various parts of the same swamp during May or early June. In 1899, I did not look for them until late. In 1900 was found the nest mentioned above. In 1901 and 1902, I again saw Creepers both in May or the first week in June, but could not find a nest. In 1903, the greater part of the suitable old growth had been cut, and I saw no birds; while in 1904, I was not able to visit the

swamps at all. So much for my cedar swamp at North Scituate. In addition, in 1897, I saw a pair of Brown Creepers in another cedar swamp some six miles distant from the one in which the nest was found in 1900; and in 1899, about May 12, I met two pairs of Brown Creepers in what is known as "Valley Swamp," near South Weymouth. It seems to me that the right of the Brown Creeper to a place among the regular summer birds nesting locally and sparingly in favorable localities in southern Massachusetts, is sufficiently vindicated, after having been challenged and doubted for many years. The conditions which determine the distribution of the Creeper in this region, are apparently a very moist, humid atmosphere, dense evergreen growth, through which the sun penetrates with difficulty, and considerable extent of wild woodland which is not disturbed by man throughout the nesting season. That the bird is common in the breeding season I do not believe. That it is far more common than has been supposed, it seems to me is also evident. That it is and has been a regular summer resident in the cedar swamps of Massachusetts — unseen because usually inaccessible — needs little if any additional proof. Unfortunately, May and June have been with me the busiest months of the year, and I have had little opportunity to search as carefully or as often for the bird and its nest as I have desired.

THE BREEDING OF THE BROWN CREEPER IN EASTERN MASSACHUSETTS.

BY FREDERIC H. KENNARD AND FREDERIC B. MCKECHNIE.

Plates X-XII.

As a first record of the breeding of the Brown Creeper (*Certhia familiaris americana*) in eastern Massachusetts we have the account of Dr. J. A. Allen in his 'Catalogue of the Birds of Springfield, Mass.'¹ in which he describes the bird as "common. Resident;

¹ Proceedings Essex Institute, Vol. IV, July, 1864, p. 69.

but most numerous in winter. Found mostly in high open woods, but also common in city. Breeds sparingly." Then he goes on to say: "Mr. Bradley Hosford showed me a nest of this species June 2nd, 1863, containing young that had apparently been hatched for some four or five days. The nest was in a large elm, in Court Square, Springfield, about ten feet from the ground, and built behind a strip of thick bark that projected in such a way as to leave a protected cavity behind it."

Then after a number of years H. D. Minot, in 'The Land Birds and Game Birds of New England,' published in 1877, speaks on page 68 of having found, presumably in the early 70's, "in the neighborhood of Boston," a nest containing fresh eggs, "a few feet from the ground placed in the cavity formed by the rending of a tree by lightning."

Next, the late Dr. T. M. Brewer, in an article on 'The American Brown Creeper,'¹ writes of its nesting "recently near Lynn, Mass.," and then of its nest being found "after a careful search by Mr. Charles T. Snow of Taunton, on the 27th of May, 1878, in the middle of a large maple swamp, where he had noticed the presence of the bird for several previous summers, without being able to discover its nest." This last evidence is of importance as showing both the continued presence of the bird in this locality for several years, as well as the difficulty in finding its nest. Then he goes on to say, speaking of the nest: "This had been constructed between the bark and the trunk of a dead pitch pine," and after further describing it says that "the young were just leaving the nest, which was ten feet from the ground."

With only the above records to fall back upon, although Stearns and Coues² went to the extreme of speaking of this bird as "resident throughout New England and a common bird in all suitable localities," it is only natural that at this time it was held that the breeding of the Brown Creeper in eastern Massachusetts was of "rare and exceptional occurrence."

¹ Bulletin of the Nuttall Ornithological Club, Vol. IV, No. 2, April, 1879, pp. 88, 89.

² New England Bird Life, Vol. I, p. 90, 1881, by W. A. Stearns, edited by Dr. Elliott Coues.

In October, 1879, appeared Mr. Wm. Brewster's most interesting article on 'The Breeding Habits of the American Brown Creeper,'¹ an article with which all the readers of 'The Auk' should, if possible, be familiar before perusing the present paper. In it Mr. Brewster describes very beautifully and at length, the finding of a number of nests of this bird near Lake Umbagog, Me., between May 31 and June 23, 1879.

With the exception of the fact that the late Mr. Elwin A. Capen of Canton, Mass., has told Mr. McKechnie of a pair of these birds which spent one breeding season near his home in the early 80's but whose nest he had been unable to discover, although he felt confident that it was somewhere in the vicinity, there seems to be a lapse in the records of the breeding of the Brown Creeper in eastern Massachusetts, till Dr. Arthur P. Chadbourne published a record² in which he tells of seeing Brown Creepers in a swamp near Plymouth, Mass., during the months of June and July. In speaking of the swamp he says, "in many portions the original growth of huge white cedars (*Cupressus thyoides*) and hemlock (*Abies canadensis*) have never been cut." Afterwards, we believe, Dr. Chadbourne found these birds supposedly breeding for several successive years, and on one occasion found their nest which he photographed.³

The next record of the breeding of this bird in eastern Massachusetts that we know of, and hitherto unpublished, has been sent to us by Mr. Wm. Brewster, and will be cited by him in his forthcoming 'Birds of the Cambridge Region of Massachusetts.' In it Mr. Brewster states that "in 1898 a nest of the Brown Creeper was found at Andover, Mass., by the late Mr. Howard S. Ford of that place," who wrote him that "it was in a dead oak, placed within a sneath of loose bark about four feet from the ground. The tree stands in an oak grove which lies between cultivated fields on the one hand, and an extensive swamp on the other."

¹ Bulletin of the Nuttall Ornithological Club, Vol. IV, October, 1879, pp. 199-209.

² The Auk, Vol. XIII, October, 1896, p. 346.

³ Since the above was written Dr. Chadbourne has sent an article to the current number of 'The Auk' giving a full and detailed account of this occurrence.

"This nest," Mr. Brewster adds, "was discovered on April 26, when it was finished, but empty. There were three eggs on May 6, and six on May 13."

So, with only the above records, while it has been generally accepted that the Brown Creeper breeds not uncommonly in certain western and higher portions of the State,¹ it has not been conceded that they breed otherwise than accidentally in the eastern and lower portions of the State.

The writers of this paper have, however, long been of the opinion that the Brown Creeper was not so rare, in certain portions at least of eastern Massachusetts, as was generally supposed.

A pair of Creepers had been seen during several breeding seasons in the late 80's, about a certain woodland near a swamp not far from the home of Mr. Kennard at Brookline, Mass. Not, at this time, knowing how or where or when their nests should be hunted, his searches were unsuccessful, and not being aware of their supposed rarity at this season, we regret to say no record of the dates was kept.

Mr. McKechnie had noted in a swamp at Canton, Mass., on May 13, 1898, one bird, which, from its peculiar actions, he supposed had a nest nearby. He saw Creepers again in this same swamp in one of the succeeding years, the date of which, however, has been lost, and noted a pair of them there still later on May 11, 1902, while on May 28, 1903, in this same swamp, he chanced upon a nest with young, while hunting for the nest of a Canadian Warbler (*Wilsonia canadensis*).

He was watching a pair of Warblers, when his attention was attracted by a Brown Creeper moving quickly, and apparently anxiously, from tree to tree, gathering something in her bill, either nesting material or food. All at once he saw two birds instead of one, and they appeared to have a strong liking for a certain group of young hemlocks, till suddenly one of them disappeared, and

¹ See Walter Faxon, 'The Summer Birds of Berkshire County, Mass.,' *The Auk*, Vol. VI, April, 1889; Faxon and Hoffmann, 'The Birds of Berkshire County, Mass.,' in 'Collections of the Berkshire Historical and Scientific Society,' published by the society in 1900; and Howe and Allen, 'The Birds of Massachusetts,' p. 90.



FIG. 1. BROWN CREEPER'S NESTING TREE.



FIG. 2. BROWN CREEPER'S NESTING SITE.

shortly reappeared minus the contents of its bill. Then, after a few minutes, the other bird, flitting in the same direction and watched closely, was seen to enter a slit about one and one-half feet from the base of a nine-inch red maple growing beside the hemlocks. On approaching the tree the old bird flew out disclosing a nest full of young, nearly fledged, number unknown, although four were visible. The slit was about ten inches long by one and one-half inches wide, and led into a hollow within the tree. (Plate X, Fig. 1.)

The finding of this nest in 1903, and the supposition that these birds probably built there every year, caused us to make up our minds that we would not only find this nest again in the spring of 1904, but would also keep our eyes and ears open for Creepers in other suitable localities, either in Canton, or Brookline, or elsewhere; with the result that we actually found four nests with eggs, in four different swamps, and knew of one other pair of birds for whose nest we did not have time to hunt.

For convenience we will take each nest separately, giving as briefly as possible an account of its finding and the methods employed in hunting for it.

At Brookline, Mass., on April 25, 1904, at about dusk, while walking along a path bordering the swamp about which Creepers had in previous years been seen in the breeding season, Mr. Kennard was startled by hearing a strange, sweet song, one that was new to him, and which he soon found came from one of a pair of Creepers that were flitting along the hillside beside the swamp.

This song which they repeat at intervals while flitting and feeding about the tree trunks, is difficult to describe, except to say, perhaps, that while it is nothing like that of the Winter Wren, either in length or strength, it nevertheless reminds one of it on account of what may be called its sylvan quality. Mr. Kennard watched them for some time, until it was dark, and they had flown off across the swamp, then noting the exact locality, he resolved to return at a later day.

On May 2, a careful search was made for these birds, and after about an hour's unsuccessful hunt they were finally located, near where they had been seen before. They seemed, however, to have no idea of visiting their nest, if they had one, but spent their time feeding, and led a fruitless chase about the swamp.

Whatever our success later in finding and tracing them to their nests, we owe to our method of first locating them by ear, listening for those faint call notes that they utter so constantly while feeding, and which are so singularly like those of the Golden-crowned Kinglet; and then when once seen, following them wherever they may lead, through swamps and thickets, never losing sight of them for a moment, if possible.

May 3, at about 3:30 P. M., after a half hour's search, these birds were again located near where they had been seen before, and after about an hour's watching and wading back and forth through the swamp, which was two to three feet deep with water, one of the birds was seen to go behind a piece of loose bark about ten feet up, on an old dead maple stub. (Plate X, Fig. 2.) Behind this bark was a typical nest, evidently an old one, but from its remarkably good state of repair, undoubtedly last year's.

Needless to say, upon this discovery, efforts at finding this year's nest were redoubled, and as the birds had been lost sight of while the old nest was being inspected, a systematic search of that part of the swamp was begun, till finally at about 6:15 P. M. a bunch of sticks was discovered protruding beneath the bottom of a piece of bark about four and one-half feet up, on the stub of a dead fifteen-inch white pine.

This proved to be the much sought for nest; not quite finished as to superstructure and lining, and also apparently ready to fall into the water on the slightest provocation. (Plate XI, Fig. 1.) So sticks were stuck beneath it into the cracks of the tree as a support; these, however, proved later to have been unnecessary, as the nest was firmly secured to the trunk of the tree by cobwebs, plant down, etc., with which the rather bulky foundation was held together.

The birds had not been seen since the discovery of the old nest about an hour and a half before.

On May 6, this nest seemed to be about completed. The sides or points at each side of the nest, which Mr. Brewster calls 'horns,' had been built up and made more compact, and the hollow thus formed between these horns and the trunk and the bark of the tree had been lined and made into a beautiful soft deep cup. The Creepers were calling to each other and feeding, as usual,

but at the other end of the swamp. They had never been seen within 60 or 75 yards of their nest. If the nest were approached they always kept quiet, and this afternoon, while it was being watched for over an hour, they made no appreciable move, one of them sitting in one spot for about twenty minutes, never making a motion except to turn his head in watching the watcher.

On May 8 the nest contained one egg, and the birds were up to their usual tactics of feeding, apparently unconcernedly, the male singing spasmodically, when no one was near the nest, or keeping absolutely quiet if the nest was approached. May 11 the nest contained three eggs, and the birds were again at their usual tactics. May 15 we both visited the nest, and procured a set of seven beautiful eggs, Mr. McKechnie taking several photographs in spite of the fact that it was cold and rainy, and we were bare-legged in icy cold water. The female was sitting as we approached, and only flew off upon the appearance of a human eye within a few inches of her as she sat on her nest. She flitted about for a few moments on the neighboring tree trunks until we had stepped back a little way from her nest, when she quickly flew to it, alighting on the trunk just beneath and then running up and in under the bark, and this, in spite of the fact that Mr. McKechnie was setting up his camera within fifteen feet of her. We flushed her from the nest several times, and she invariably returned as soon as there was an opportunity. The male hung about at a distance, calling to her but never coming very near.

On May 1, 1904, the writers watched and followed for over an hour the pair of Creepers, at Canton, Mass., of which Mr. McKechnie had known for several seasons, and the young of which he had found the previous year. They led us away from the swamp in which we had located them, feeding, singing, and flitting about in such an aimless sort of fashion that we finally gave up following them, thinking from their actions either that they had not yet begun to lay, or else that their set of eggs was as yet incomplete. Mr. McKechnie returned here on the 8th of May and could find only one bird, which lead him off out of the swamp and then, leaving him, flew back, not to be seen again. After hunting around for two hours he concluded the female was sitting and the male keeping quiet pending his departure.

On May 14 we both returned to this swamp and were lucky enough to find one of the birds within five minutes by our usual method of listening for their call notes. After watching him for perhaps ten minutes he suddenly flew to the foot of a small dead red maple, and from an aperture in this same maple hopped the female whom he fed. This aperture was about three and one-half feet from the ground and led into the nest, which was built like a Chickadee's in the heart of the tree, and which contained seven well incubated eggs. Although it was raining, McKechnie started in immediately to photograph the nest, while Kennard endeavored to keep the female away from it till McKechnie could set up his camera, and catch her if possible as she entered. (Plate XI, Fig. 2.) She seemed, however, to be particularly solicitous, succeeded in getting back on to her eggs, and stuck so close that after pounding on the tree, shaking it, etc., all to no purpose, we finally had to pry her off with a stick, a dangerous process so far as the eggs were concerned. When off the nest she never went far away, while the male, on his part, seldom came near except to feed her, which he did several times, both when she was on her eggs and came out to be fed, and after she had been dislodged and was on some neighboring tree.

The maple was one of twins -- the other being alive -- and stood in a very large wet maple swamp (Plate XII, Fig. 1) in which there were a few pines and hemlocks, large and small, scattered about, but in which there appeared to be none of those large dead trees with pendant strips of bark which the Creepers seem to like best; this probably accounting for their building in holes both in 1903 and 1904.

On the afternoon of May 1, 1904, while walking along the edge of another swamp in Canton, perhaps a mile or so from the swamp where we had in the morning been watching the above Creepers, we first heard and then saw another Creeper with something in her bill. We sat down and kept quiet until she finally flew to a dead white pine and disappeared under a piece of bark some twelve or fifteen feet from the ground. She soon emerged, however, and repeated the operation several times, until finally appearing to catch sight of us, she vanished. We went to the foot of the tree, but could see nothing and did not dare to climb it for fear of further disturbing her.

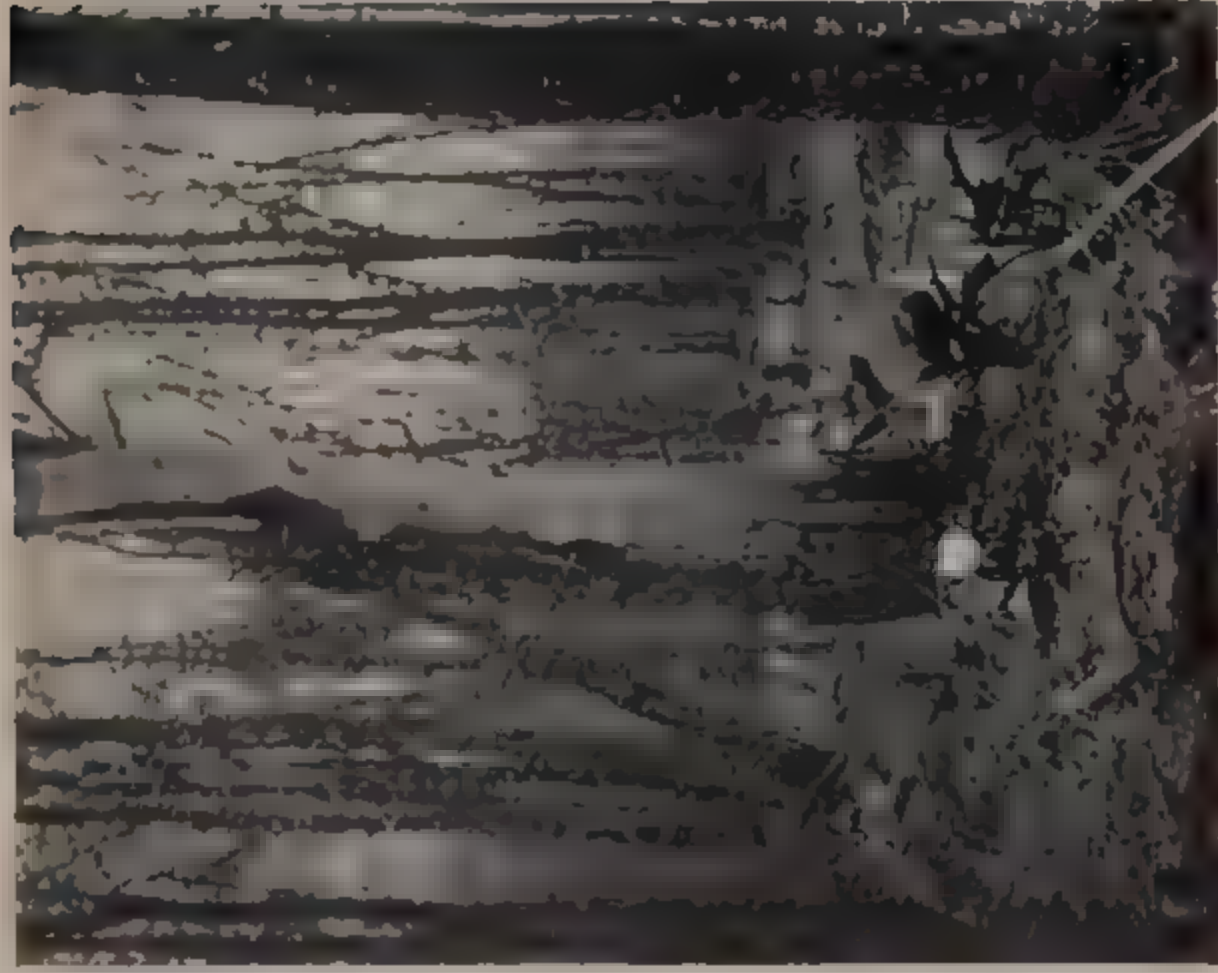


FIG. 1. BROWN CREEPER'S NEST

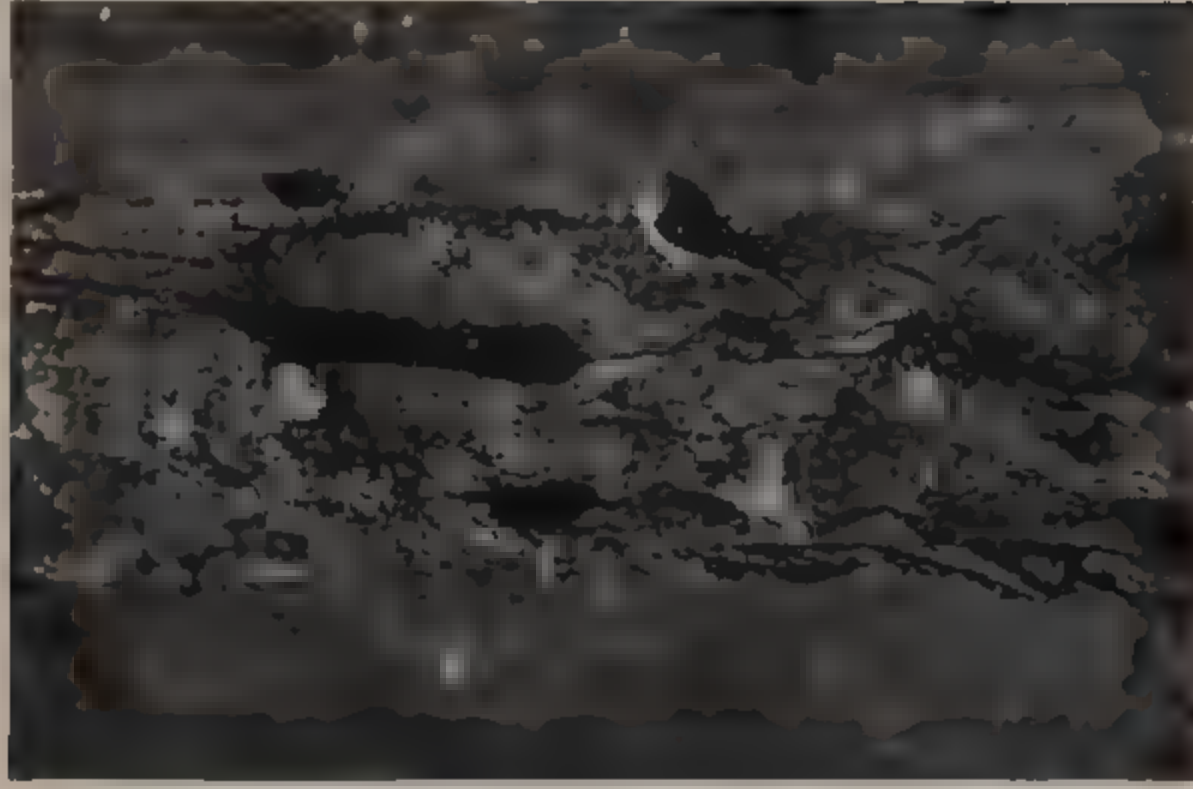


FIG. 2. BROWN CREEPER ON NESTING TREE

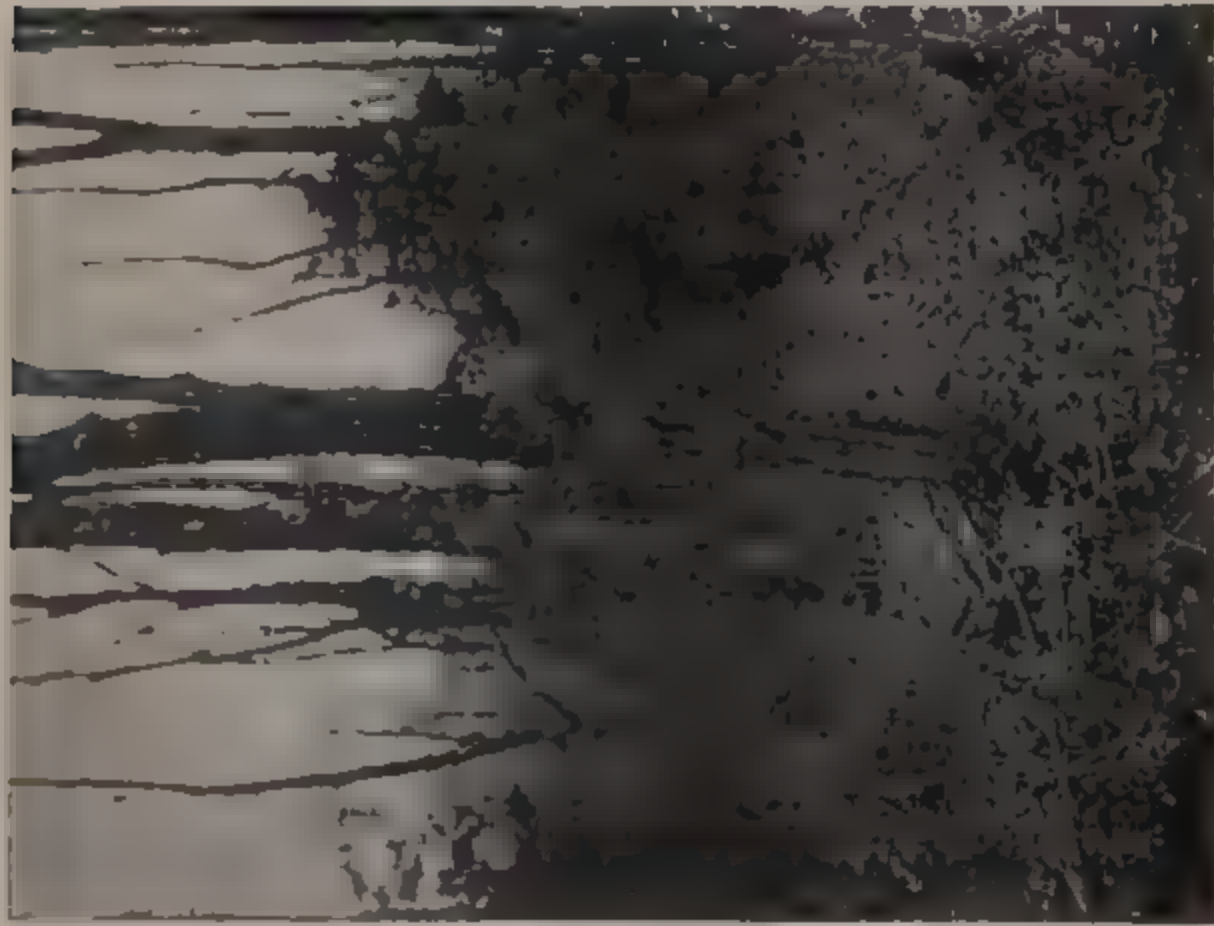


FIG. 1 BROWN CREEPER, NANTING-SITE.

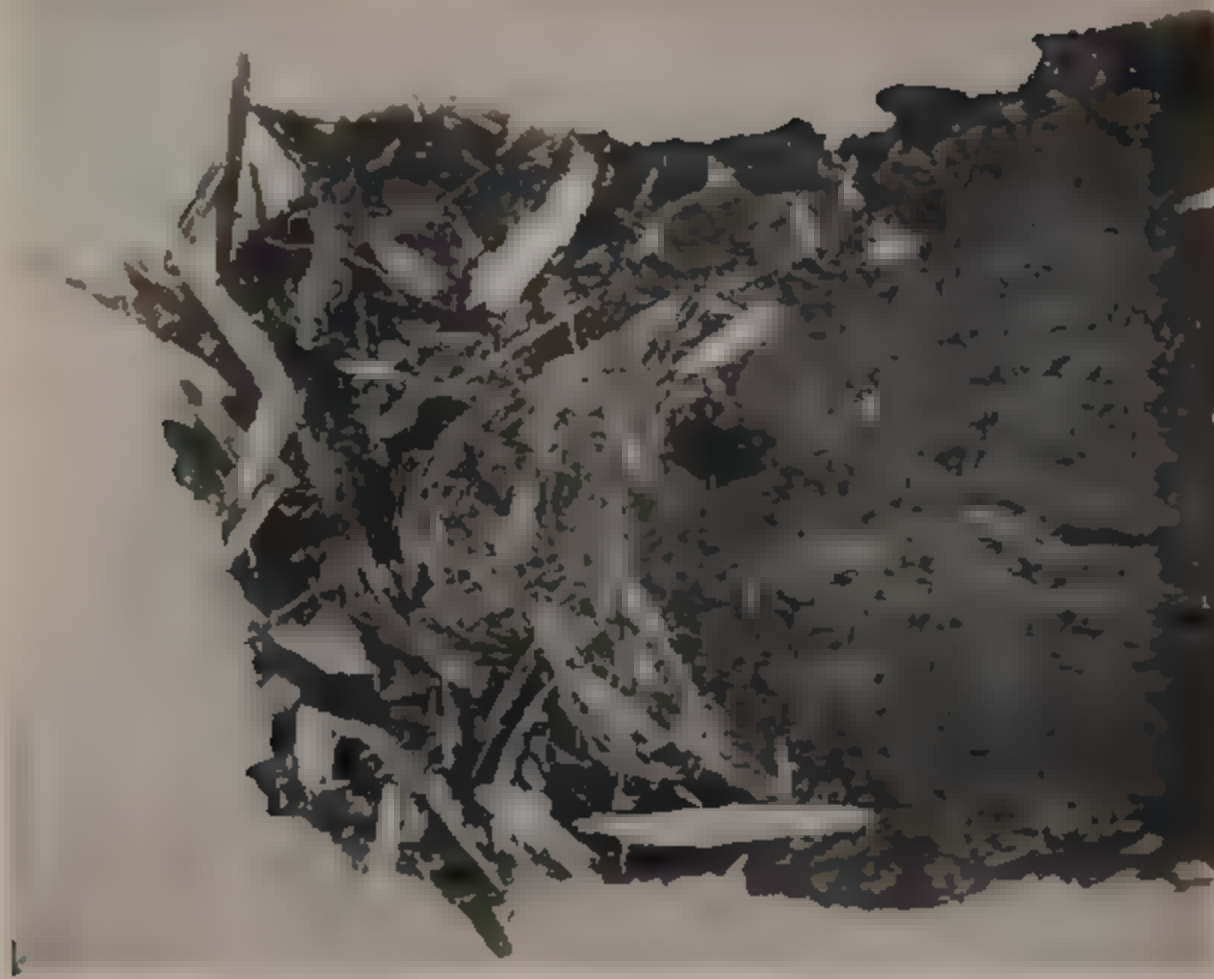


FIG. 2 NEW OF BROWN CREEPER

On May 8 Mr. McKechnie visited this swamp again and found both birds easily. He watched the male for about an hour, until the female appeared and attracted his attention by perching practically immovable for another hour, watching him, preening herself, etc., until she finally tired him out. The male had during this time visited her often with food.

An inspection of the supposed nesting site, however, revealed the fact that they had done nothing to it and had apparently moved elsewhere; possibly they had been frightened away by our watching them on May 1. On May 13 we both visited the swamp at about 9 A. M. We thought we heard their call note once, but we were unable to find them. So, as they were behaving this way, we concluded to make a systematic search, which was finally rewarded after about an hour and a half of wading and crawling in water and sphagnum through all kinds of thickets, high bush blueberries, black alders, clethra, mountain holly, and the like, by the finding of the nest with five fresh eggs behind the bark of a dead 14-inch white pine, some little distance from where we had first seen them. The nest was not what one could truly call conspicuous, only a few twigs showing through a rift in the bark some 12 or 15 feet up, and just above the second limb on the right of the trunk, the whole tree being pretty well covered with bark. On May 16 Mr. McKechnie took a set of six fresh eggs from this nest. The female was sitting as he approached, and stayed on her eggs until he had climbed up and was actually looking in at her, when she hopped off the nest, and after clinging for a moment to the trunk just above it, disappeared through a back entrance.

Both birds hung about the vicinity for a while, but seemed possibly less solicitous than had the other pairs in our experience. She only went to the nest once while it was being photographed, and the male fed her occasionally. Plate XII, Fig. 2, shows a back view of this nest as it looked when stripped from the tree, together with its bark thatch.

On May 12, 1904, at about dusk, while Mr. Kennard was in the top of a red maple on the edge of a swamp in Canton, inspecting a Hairy Woodpecker's nest, he heard the call notes of a pair of Brown Creepers as they flitted through the woods behind him.

He did not see the birds, much less follow them, but only was able to note the direction in which they apparently flew.

Two days later, however, on May 14, after finding one nest in a swamp two miles away, we determined to have a look for this pair, which we guessed were probably breeding in a certain cedar swamp. The quest seemed nearly hopeless, but we had an afternoon to spare, and waded in accordingly.

The water was deep, the trees were thick and the swamp particularly dark, as it was cloudy, while the leaves that were then bursting forth added very materially to our difficulties. However, after an hour, we at last thought we heard one of the call notes of the Creeper, a note that closely resembles that soft call which Chickadees often utter when feeding and which differs somewhat from the Creeper's ordinary Kinglet-like call. After considerable search we finally discovered the Creeper, and the discovery seemed to be mutual, for he allowed us to light our pipes and sit down and watch him for about fifteen minutes, during which he never stirred until, apparently making up his mind that we were harmless, he moved on. The trees and bushes were so thick, and his movements so rapid, that it was impossible to keep an eye on him all the time, and we often had to content ourselves with merely a general idea of his whereabouts. When all at once we realized that two birds had come upon the scene, our difficulties were doubled, each of us trying to watch one bird, and often finding that we were watching the other's, particularly after the male had mixed things up by feeding the female, which he did at intervals. However, one of them finally flew to a hard pine stub, some ten feet from where one of us was standing, and disappeared beneath a long strip of bark about six feet above the water.

One of us climbed on the other's shoulders and, on prying out the bark and peeking in, found that the nest contained six fresh eggs. This nest could never have been discovered had it not been for the bird's kindness in leading us to it, as it was absolutely hidden behind a very large strip of bark, while the stub stood in the middle of a very thick tangle, so thick in fact that we were unable to photograph it, as we could not do so without cutting away a lot of trees, shrubs, etc., and we had no hatchet.

In addition to the above records, Dr. Chas. W. Townsend

writes us of his having found at Hamilton, Mass., on May 11, 1904, a pair of these birds "building a nest behind the loose bark of a pitch pine stub about ten feet from the ground."¹ It was situated in "mixed woods of white pine and white oak with a few white birch and pitch pines on the border of a red maple swamp." He was unable to look into the nest without disturbing it, but knows that they later hatched and reared their brood.

Summing up the evidence here presented, it seems to us that this species may have been in the past overlooked. The observers now are more numerous than heretofore, and accordingly are able to cover much greater territory. The birds themselves are inconspicuous and apparently very shy when building their nests or laying their eggs; and the breeding places in this vicinity, at least, that they seem best to like, leaving out of consideration such an unusual site as that recorded by Dr. Allen, appear to be in or about those cool wild swamps, which, in the breeding season are apt to be avoided by self-respecting mankind. Maple and cedar swamps, or dark pine or hemlock groves, with thickets and tangles of a more or less boreal flora, and preferably those in which dead trees and stubs may be found, to which the loose bark is still clinging.

Then again, one must get into the woods early in hunting for these birds, in order properly to locate them, perhaps while the ice is still in the swamps and the water deep. If this is not done and the leaves burst forth before the birds are found, even though when incubating they appear to be less shy, the task of finding their nest is much more difficult. They seem to breed earlier hereabouts than we had been led to suppose, and we believe that some, at least, of these birds that one sees in the latter part of April may be residents and not migrants as heretofore supposed.

Finally, after duly weighing the above evidence it seems to us that the American Brown Creeper (*Certhia familiaris americana*) may be taken from the list of birds whose breeding in eastern Massachusetts is purely accidental, and placed rather in a list of those birds, which, though perhaps rare, may be found breeding locally, but not uncommonly in suitable localities.

¹ See 'The Birds of Essex County, Mass.,' by Dr. Chas. W. Townsend.

BIRDS OF DELAWARE: A PRELIMINARY LIST.

BY SAMUEL N. RHOADS AND C. J. PENNOCK.

GEOGRAPHICAL.

DELAWARE, next to Rhode Island, is the smallest of the United States and has an area of but 2200 square miles. From Delmar on the Maryland line at the south, to the Pennsylvania State line, it reaches from latitude $38^{\circ} 28'$ to $39^{\circ} 47'$ North, — or a distance of about ninety miles. Extending these lines we find the north end of the State to be about ten miles south of the latitude of the city of Philadelphia, Pa., while the extreme southern end is on a line with Port Tobacco and Culpepper in Virginia, and over one third of the State is south of the latitude of Cape May, N. J., and Washington, D. C.

PHYSICAL.

A glance at the map of Delaware shows an extended shore line and numerous waterways. Over one hundred miles of ocean and river front on the east is pierced between Wilmington and Lewes, a distance of less than seventy-five miles, by no less than fifteen streams of sufficient importance to be named, and eight at least of sufficient size to carry light-draft steamboats, and extending on an average two-thirds of the distance across to the western border of the State. These streams form the upper and lower — north and south — boundaries of the various 'Hundreds,' corresponding to townships or towns in other States, and are bordered generally by marshes, salt or fresh, as the case may be, for a considerable part of their extent. Below Lewes the broad expanses of Rehobeth, Indian River, and Assawaman Bays offer great attractions to the aquatic and littoral migrants and residents.

The southern half of the State still contains large bodies of timber, reaching their greatest development on the river bottoms of the Choptank and Nanticoke in the southwest, and continuing across the Maryland 'Eastern Shore' to Chesapeake Bay.

Across the upper end of the State and included in the semi-circular arc, but embracing less than one-half of that segment, we

find almost all of the hilly section of the State. From this elevated area, running southward and followed by the line of the railroad, is a narrow, slightly elevated plateau, which forms the watershed between the Delaware and Chesapeake basins. After crossing the Delaware and Chesapeake Canal by railroad about twelve miles from Wilmington, we find almost no elevation worthy of the name of hill, and from Clayton south the entire State is extremely level with numerous extensive, low, wet, undrained areas.

FLORAL.

We have not found any hemlocks growing native in Delaware, but a few are found along the Brandywine Creek, but a few miles north of the Delaware State line, in Chester County, Pa. There are yet remaining a few cypress trees along the borders of Indian River Bay, and, until destroyed by fire a few years ago, a considerable body of cypress was to be found in the Cypress Swamp, indicated on older maps of Delaware as extending into Maryland. The long-leaf or southern pine is found abundantly in Sussex County, along the line of the railroad, but disappears at or near Harrington, which place is at the head-waters of the Nanticoke River.

FAUNAL.

The State as a whole is of course referable to the Carolinian Fauna, but the bird-life of the southern portion contains several species typical of the Lower Austral life zone as defined by Merriam.

A feature that may have considerable bearing on the occurrence of certain species of birds found in Delaware and but rarely to the north and east thereof, is perhaps to be explained by the position of the State in reference to Delaware Bay and its broad waters and open exposure to the Atlantic, presenting a barrier to the passage of such species as may have already about reached their northernmost limit of migration. As a case in point, the Mockingbird is an extremely rare species through southern New Jersey, while in suitable localities in Delaware it is to be found

nesting as far up the State as Delaware City, fifty miles north of Cape May.

Just why Delaware has been so persistently ignored by ornithologists seems difficult to determine, but the fact remains, that since Wilson's scant and for the most part casual notes, but few trustworthy records have been found relating to this section. Turnbull in his 'Birds of East Pennsylvania and New Jersey' gives a few records; in 'The Auk' for 1885, Dr. Dwight records one species new to the State; Mr. W. G. Smith of the Delaware Valley Ornithological Club, in the Club's 'Proceedings' for 1898, reports a trip to Maryland; and in 'The Wilson Bulletin' No. 34, Mr. F. L. Burns gives some interesting vernacular names from Kent County.¹

We have found but one collection of Delaware birds of any considerable number. This was made several years ago by the late Mr. W. D. Bush of Wilmington, Del., and it is now deposited with the Friends' School in Wilmington. The collection is of particular value in having for the most part accurate data accompanying the specimens. Mr. Bush kindly gave us access to the collection and placed his annotated list at our disposal. For the most part, however, the present list merits publication on the basis of local systematic field work taken up within the last few years by Mr. Pennock during frequent visits in eastern and central New Castle County, and more particularly to that carried on more thoroughly in the southern part of the State by both authors during the years 1903 and 1904.

Geographically and topographically the State might be divided into four rather distinct areas of Faunal distribution:—

(1) The Hill Country, of very limited extent in the north end of the State and in a slight degree *approaching* the Alleghanian Fauna. The hills bordering the Christiana, Brandywine, White Clay, and Red Clay Creeks are embraced in this area.

(2) Intermediate area, comprising the central plateau and the more elevated tracts between the streams emptying into the Delaware and Chesapeake Basins.

¹ Other references will be found in a Bibliography of Delaware Ornithology in course of preparation.

(3) Marsh region, maritime and fresh, belonging to the Delaware Basin.

(4) Chesapeake Basin, comprising the bottom-lands of the Choptank and Nanticoke Rivers.

The list subjoined is far from complete and is based on notes of a Preliminary List which was presented by the authors at the annual meeting of the American Ornithologists' Union held in Philadelphia in November, 1903. Much work remains to be done in the State in this line, and it is attractive because so nearly pioneer. The writers desire to acknowledge their obligations for valued assistance in connection with the accompanying list, to the late Walter D. Bush, Esq., of Wilmington, Del.; Mr. E. W. Woolman and R. F. Miller of Philadelphia, Pa.; and to Mr. Witmer Stone of the Academy of Natural Sciences of Philadelphia, who have so cordially assisted, by the loan of specimens, field notes, and otherwise, in presenting a First List of the Birds of Delaware.

Annotations here given on the occurrence, etc., of species have been confined for the most part to such as are of unusual interest.

1. *Colymbus auritus*. HORNE GREBE.— Winter resident.
2. *Podilymbus podiceps*. PIED-BILLED GREBE.— Summer resident. Found breeding near Rehobeth June 22, 1903 (S. N. R.), and in the Chesapeake basin by Lieut. Frank B. Eastman.
3. *Gavia imber*. LOON.— Winter resident.
4. *Gavia lumme*. RED-THROATED LOON.— Winter resident.
5. *Uria lomvia*. BRÜNNICH'S MURRE.— Rare straggler. A male in collection of C. J. P., was shot at "River Farm," on the Delaware River, near Odessa, December 18, 1896.
6. *Larus argentatus*. HERRING GULL.— Winter resident.
7. *Larus delawarensis*. RING-BILLED GULL.— Transient resident. Rare in winter.
8. *Larus philadelphia*. BONAPARTE'S GULL.— Transient migrant.
9. *Sterna hirundo*. WILSON'S TERN.— Summer resident. Rare. One seen by Rhoads at Rehobeth, June 22, 1903. Given by Woolman.
10. *Sterna antillarum*. LEAST TERN.— Summer resident. Almost exterminated. Four young birds in Bush's collection, taken in Sussex County, July 27, 1880. Given by Woolman.
11. *Phalacrocorax dilophus*. DOUBLE-CRESTED CORMORANT.— Transient migrant. Three Cormorants seen by Pennock, Sept. 10, 1903, are referred to this species.
12. *Merganser serrator*. RED-BREASTED MERGANSER.— Winter resident.

13. *Anas boschas*. MALLARD.—Winter resident.
14. *Anas obscura*. BLACK DUCK.—Resident. Occasionally remains to breed. Common in winter.
15. *Mareca americana*. BALDPATE.—Winter resident. Mr. Woolman gives it as unusually abundant during winter of 1903-04.
16. *Nettion carolinensis*. GREEN-WINGED TEAL.—Winter resident.
17. *Querquedula discors*. BLUE-WINGED TEAL.—Winter resident.
18. *Spatula clypeata*. SHOVELLER.—Winter resident. Included in Woolman's list.
19. *Dafila acuta*. PINTAIL.—Winter resident.
20. *Aix sponsa*. WOOD DUCK.—Summer resident. Breeds regularly, but not abundantly, throughout the State.
21. *Aythya americana*. REDHEAD.—Winter resident. Given by Woolman.
22. *Aythya vallisneria*. CANVASBACK.—Winter resident. One shot by H. C. Webb, near Odessa, March 22, 1903. Given by Woolman.
23. *Aythya marila*. SCAUP DUCK.—Winter resident.
24. *Aythya affinis*. LESSER SCAUP DUCK.—Winter resident.
25. *Clangula clangula americana*. AMERICAN GOLDEN-EYE.—Winter resident. Included in Bush's list.
26. *Charitonetta albeola*. BUFFLE-HEAD.—Winter resident.
27. *Harelda hyemalis*. OLD SQUAW.—Winter resident. A mounted specimen seen in a private collection at Dover, October, 1903.
28. *Somateria spectabilis*. KING EIDER.—Straggler. Two Eiders recorded by Mr. Woolman were presumably of this species.
29. *Oidemia americana*. AMERICAN SCOTER.—Winter resident.
30. *Oidemia deglandi*. WHITE-WINGED SCOTER.—Winter resident.
31. *Erismatura jamaicensis*. RUDDY DUCK.—Winter resident.
32. *Chen hyperborea nivalis*. GREATER SNOW GOOSE.—Winter resident. Occurs at rare intervals. On Woolman's list.
33. *Branta canadensis*. CANADA GOOSE.—Winter resident.
34. *Branta bernicla*. BRANT. Winter resident.
35. *Olor columbianus*. WHISTLING SWAN.—Winter resident. Extremely rare on Rehobeth Bay.
36. *Botaurus lentiginosus*. AMERICAN BITTERN.—Summer resident. Common in spring and fall; rare during nesting season.
37. *Ardetta exilis*. LEAST BITTERN.—Summer resident.
38. *Ardea herodias*. GREAT BLUE HERON.—Resident.
39. *Herodias egretta*. AMERICAN EGRET.—Straggler.
40. *Butorides virescens*. GREEN HERON.—Summer resident.
41. *Nycticorax nycticorax nævius*. BLACK-CROWNED NIGHT HERON.—Summer resident.
42. *Rallus elegans*. KING RAIL.—Resident. Not uncommon throughout summer; rarely winters.
43. *Rallus crepitans*. CLAPPER RAIL.—Summer resident.
44. *Rallus virginianus*. VIRGINIA RAIL.—Summer resident.

45. *Porzana carolina*. SORA.—An abundant migrant; a few are said to remain and breed.
46. *Fulica americana*. AMERICAN COOT.—Transient migrant. Possibly breeds rarely.
47. *Gallinula galeata*. FLORIDA GALLINULE.—Summer resident; abundant migrant. An adult and four very small young seen near Odessa, July 5, 1902 (C. J. P.).
48. *Philohela minor*. WOODCOCK.—Resident.
49. *Gallinago delicata*. WILSON'S SNIPE.—Transient migrant. A few usually remain through milder winters.
50. *Macrorhamphus griseus*. DOWITCHER.—Transient migrant. One in Bush collection, from New Castle County, October, 1881.
51. *Actodromas minutilla*. LEAST SANDPIPER.—Transient migrant.
52. *Actodromas fuscicollis*. WHITE-RUMPED SANDPIPER.—Transient migrant. A female was captured near Lewes, June 8, 1898 (C. J. P.).
53. *Ereunetes pusillus*. SEMIPALMATED SANDPIPER.—Transient migrant. Occasional in winter.
54. *Ereunetes occidentalis*.—WESTERN SANDPIPER.—Transient migrant. One specimen in Bush collection taken in the State; no date.
55. *Calidris arenaria*. SANDERLING.—Winter resident.
56. *Totanus melanoleucus*. GREATER YELLOW-LEGS.—Transient migrant.
57. *Totanus flavipes*. YELLOW-LEGS.—Transient migrant.
58. *Helodromas solitarius*. SOLITARY SANDPIPER.—Transient migrant.
59. *Bartramia longicauda*. BARTRAMIAN SANDPIPER.—Summer resident.
60. *Actitis macularia*. SPOTTED SANDPIPER.—Summer resident.
61. *Oxyechus vociferus*. KILLDEER.—Resident.
62. *Ægialitis semipalmata*. SEMIPALMATED PLOVER.—Transient migrant.
63. *Ægialitis meloda*. PIPING PLOVER.—Summer resident.
64. *Colinus virginianus*. BOB-WHITE.—Resident.
65. *Bonasa umbellus*. RUFFED GROUSE.—Formerly not uncommon in northern hill country. One was shot in the fall of 1902 in Pennsylvania within a mile of Delaware state line.
66. *Zenaidura macroura*. TURTLE DOVE.—Resident.
67. *Cathartes aura*. TURKEY VULTURE.—Resident.
68. *Circus hudsonius*. MARSH HAWK.—Resident.
69. *Accipiter velox*. SHARP-SHINNED HAWK.—Resident.
70. *Accipiter cooperi*. COOPER'S HAWK.—Resident.
71. *Buteo borealis*. RED-TAILED HAWK.—Resident.
72. *Buteo lineatus*. RED-SHOULDERED HAWK.—Resident.
73. *Buteo platypterus*. BROAD-WINGED HAWK.—Resident.
74. *Haliaeetus leucocephalus*. BALD EAGLE.—Resident.
75. *Falco peregrinus anatum*. DUCK HAWK.—Winter resident.

76. *Falco columbarius*. PIGEON HAWK. — Winter resident.
77. *Falco sparverius*. SPARROW HAWK. — Resident.
78. *Pandion haliaëtus carolinensis*. OSPREY. — Summer resident.
79. *Strix pratincola*. AMERICAN BARN OWL. — Resident.
80. *Asio accipitrinus*. SHORT-EARED OWL. — Winter resident.
81. *Asio wilsonius*. AMERICAN LONG-EARED OWL. — Resident.
82. *Syrnium varium*. BARRED OWL. — Resident. Common in Chesapeake Basin.
83. *Nyctala acadica*. SAW-WHET OWL. — Winter resident. One in Bush collection taken in January, 1879. One seen in a taxidermist's shop in Wilmington, taken in the State, during winter of 1903-04.
84. *Megascops asio*. SCREECH OWL. — Resident.
85. *Bubo virginianus*. GREAT HORNED OWL. — Resident.
86. *Nyctea nyctea*. SNOWY OWL. — Winter straggler. One in Bush collection taken in the State; no record of locality or date.
87. *Coccyzus americanus*. YELLOW-BILLED CUCKOO. — Summer resident.
88. *Coccyzus erythrophthalmus*. BLACK-BILLED CUCKOO. — Summer resident.
89. *Ceryle alcyon*. BELTED KINGFISHER. — Resident.
90. *Dryobates villosus*. HAIRY WOODPECKER. — Resident.
91. *Dryobates pubescens medianus*. DOWNY WOODPECKER. — Resident.
92. *Sphyrapicus varius*. YELLOW-BELLIED WOODPECKER. — Winter resident.
93. *Ceophloeus pileatus (abieticola ?)*. PILEATED WOODPECKER. — Resident. Still seen rarely throughout lower Delaware where the timber tracts are extensive.
94. *Centurus carolinus*. RED-BELLIED WOODPECKER. — Summer resident. Found breeding at Marydel; may remain in winter.
95. *Colaptes auratus luteus*. FLICKER. — Resident.
96. *Antrostomus vociferus*. WHIP-POOR-WILL. — Summer resident.
97. *Chordeiles virginianus*. NIGHTHAWK. — Summer resident.
98. *Chætura pelagica*. CHIMNEY SWIFT. — Summer resident.
99. *Trochilus colubris*. HUMMINGBIRD. — Summer resident.
100. *Tyrannus tyrannus*. KINGBIRD. — Summer resident.
101. *Myiarchus crinitus*. CRESTED FLYCATCHER. — Summer resident.
102. *Sayornis phœbe*. PHOEBE. — Summer resident.
103. *Contopus virens*. WOOD PEWEE. — Summer resident.
104. *Empidonax virescens*. GREEN-CRESTED FLYCATCHER. — Summer resident.
105. *Otocoris alpestris*. HORNED LARK. — Winter resident.
106. *Cyanocitta cristata*. BLUE JAY. — Resident.
107. *Corvus brachyrhynchos*. AMERICAN CROW. — Resident.
108. *Corvus ossifragus*. FISH CROW. — Resident.
109. *Dolichonyx oryzivorus*. BOBOLINK. — Transient migrant. A

male in apparently full spring plumage seen at River Farm, July 19, 1903 (C. J. P.).

- 110. *Molothrus ater*. COWBIRD. — Resident. Rare in winter.
- 111. *Agelaius phoeniceus*. RED-WINGED BLACKBIRD. — Resident.
- 112. *Sturnella magna*. MEADOWLARK. — Resident.
- 113. *Icterus spurius*. ORCHARD ORIOLE. — Summer resident.
- 114. *Icterus galbula*. BALTIMORE ORIOLE. — Summer resident.
- 115. *Euphagus carolinus*. RUSTY GRACKLE. — Winter resident.
- 116. *Quiscalus quiscula*. PURPLE GRACKLE. — Resident.
- 117. *Carpodacus purpureus*. PURPLE FINCH. — Winter resident.
- 118. *Loxia curvirostra minor*. RED CROSSBILL. — Winter resident.

One seen by Dr. W. E. Hughes, near Lewes, May 19, 1895.

119. *Acanthis linaria*. REDPOLL. — Winter straggler. One in Bush collection taken in New Castle County in "spring of 1882."

120. *Astragalinus tristis*. AMERICAN GOLDFINCH. — Resident.

121. *Spinus pinus*. PINE SISKIN. — Winter resident. Two in Bush collection dated October, 1878.

122. *Passerina nivalis*. SNOWFLAKE. — Winter resident. A small flock seen by Pennock at Lewes, Feb. 5, 1904.

123. *Poocetes gramineus*. VESPER SPARROW. — Summer resident. Rare in the lower part of the State and on the Choptank. Common in more northern sections.

124. *Passerculus princeps*. IPSWICH SPARROW. — Winter resident. Recorded from Rehobeth, by Dr. J. Dwight, Jr., in 'The Auk,' January, 1885.

125. *Passerculus sandwichensis savanna*. SAVANNAH SPARROW. — Transient migrant. Probably also a winter resident.

126. *Coturniculus savannarum passerinus*. GRASSHOPPER SPARROW. — Summer resident.

127. *Ammodramus henslowii*. HENSLOW'S SPARROW. — Summer resident. Mr. Rhoads noted it during the breeding season of 1903 at Delaware City, New Castle County, and in lower Sussex County. Noted two at River Farm, July 10, 1904 (C. J. P.).

128. *Ammodramus caudacutus*. SHARP-TAILED SPARROW. — Summer resident. Probably not rare in suitable localities. One shot June 8, 1898, at Lewes (C. J. P.).

129. *Ammodramus maritimus*. SEASIDE SPARROW. — Summer resident.

130. *Zonotrichia leucophrys*. WHITE-CROWNED SPARROW. — Transient migrant. One specimen secured Oct. 8, 1904, in upper New Castle County (C. J. P.).

131. *Zonotrichia albicollis*. WHITE-THROATED SPARROW. — Winter resident.

132. *Spizella socialis*. CHIPPING SPARROW. — Summer resident. Occasionally seen in winter.

133. *Spizella pusilla*. FIELD SPARROW. — Resident.

134. *Spizella monticola*. TREE SPARROW. — Winter resident.
135. *Junco hyemalis*. JUNCO. — Winter resident.
136. *Melospiza cinerea fasciata*. SONG SPARROW. — Resident.
137. *Melospiza georgiana*. SWAMP SPARROW. — Resident.
138. *Passerella iliaca*. FOX SPARROW. — Transient migrant.
139. *Pipilo erythrophthalmus*. TOWHEE. — Summer resident. Occasionally seen throughout the winter.
140. *Cardinalis cardinalis*. CARDINAL. — Resident.
141. *Zamelodia ludoviciana*. ROSE-BREASTED GROSBEEK. — Transient migrant.
142. *Guiraca caerulea*. BLUE GROSBEEK. — Summer resident. Adult male, in spring plumage, in Bush collection, taken near Dover, 1882. John D. Carter of Lansdowne, Pa., writes July 4, 1904: "Yesterday . . . below Medford's Mills . . . just across the line in Maryland . . . we found . . . Blue Grosbeak (male, female, and one young), not in nest."
143. *Cyanospiza cyanea*. INDIGO BIRD. — Summer resident.
144. *Piranga erythromelas*. SCARLET TANAGER. — Summer resident. Becomes scarce on southern border, being replaced by the next species.
145. *Piranga rubra*. SUMMER TANAGER. — Summer resident. A common breeder in lower Sussex County (S. N. R.).
146. *Progne subis*. PURPLE MARTIN. — Summer resident.
147. *Petrochelidon lunifrons*. CLIFF SWALLOW. — Summer resident.
148. *Hirundo erythrogastra*. BARN SWALLOW. — Summer resident.
149. *Iridoprocne bicolor*. TREE SWALLOW. — Summer resident.
150. *Riparia riparia*. BANK SWALLOW. — Summer resident.
151. *Stelgidopteryx serripennis*. ROUGH-WINGED SWALLOW. — Summer resident.
152. *Ampelis cedrorum*. CEDAR BIRD. — Resident.
153. *Lanius ludovicianus (migrans ?)*. LOGGERHEAD SHRIKE. — Transient migrant. One spring specimen — 1882 — in Bush collection. Other dates are July 9, 1903, July 21, 1899, Dec. 18, 1900. May breed occasionally.
154. *Vireo olivaceus*. RED-EYED VIREO. — Summer resident.
155. *Vireo gilvus*. WARBLING VIREO. — Summer resident.
156. *Vireo noveboracensis*. WHITE-EYED VIREO. — Summer resident.
157. *Vireo flavifrons*. YELLOW-THROATED VIREO. — Summer resident.
158. *Vireo solitarius*. BLUE-HEADED VIREO. — Transient migrant.
159. *Mniotilta varia*. BLACK AND WHITE WARBLER. — Summer resident. An abundant breeder throughout the State.
160. *Protonotaria citrea*. PROTHONOTARY WARBLER. — Summer resident. An abundant breeder in Choptank bottoms. Also noted at Seaford, June 18, 1903 (S. N. R.).
161. *Helmitherus vermivorus*. WORM-EATING WARBLER. — Summer resident. One specimen collected by Bush, from New Castle County, May, 1882. Two or three pairs feeding young along Brandywine Creek, near Wilmington, July 14, 1903 (S. N. R.).

162. *Helminthophila pinus*. BLUE-WINGED WARBLER. — Summer resident.

163. *Compsothlypis americana*. PARULA WARBLER. — Summer resident.

164. *Dendroica aestiva*. YELLOW WARBLER. — Summer resident.

165. *Dendroica caerulescens*. BLACK-THROATED BLUE WARBLER. — Transient migrant.

166. *Dendroica coronata*. MYRTLE WARBLER. — Transient migrant and winter resident. Found regularly in winter in the lower part of the State.

167. *Dendroica cerulea*. CERULEAN WARBLER. — Summer resident. June 3-6, 1903, at Choptank Mills (S. N. R.). June 18-20, 1903, Seaford (S. N. R.). "My surprise was great to hear the song of this bird mingling with that of the Prothonotary in the heavily timbered bottoms below the dam, and on down the river — Choptank. They were quite frequently seen, and kept to the higher treetops, where their actions showed plainly they were nesting. Two specimens were taken to make sure of the identification. They did not go into the highland woods adjoining the river bottoms. The breeding of so many of these birds east of the Alleghanies is much at variance with our former view of their summer habitat" (S. N. R.). A male and female shot in bottom lands of Choptank River, May 29, 1904. The female was collecting nesting material (C. J. P.).

168. *Dendroica pensylvanica*. CHESTNUT-SIDED WARBLER. — Transient migrant.

169. *Dendroica castanea*. BAY-BREASTED WARBLER. — Transient migrant.

170. *Dendroica striata*. BLACK-POLL WARBLER. — Transient migrant.

171. *Dendroica blackburniæ*. BLACKBURNIAN WARBLER. — Transient migrant.

172. *Dendroica dominica*. YELLOW-THROATED WARBLER. — Summer resident. Found breeding at Seaford and at Frankford, June 19-20, 1903 (S. N. R.).

173. *Dendroica virens*. BLACK-THROATED GREEN WARBLER. — Transient migrant.

174. *Dendroica vigorsii*. PINE WARBLER. — Summer resident.

175. *Dendroica palmarum hypochrysea*. YELLOW PALM WARBLER. — Transient migrant.

176. *Dendroica discolor*. PRAIRIE WARBLER. — Summer resident. Noted by S. N. R. at Seaford and Frankford, June 19-20, 1903. A set of four eggs collected at Newport, Del., May 25, 1903, by R. F. Miller, of Philadelphia, Pa.

177. *Seiurus aurocapillus*. GOLDEN-CROWNED THRUSH. — Summer resident.

178. *Seiurus noveboracensis*. WATER-THRUSH. — Transient migrant.

179. *Seiurus motacilla*. LOUISIANA WATER-THRUSH. — Summer resi-

dent. An abundant breeder along the Choptank, also seen June 19-20, 1903, at Seaford and Frankford (S. N. R.). Young flying along the Choptank, May 29, 1904 (C. J. P.).

180. *Geothlypis formosa*. KENTUCKY WARBLER.—Summer resident.

181. *Geothlypis philadelphia*. MOURNING WARBLER.—Transient migrant. In the Bush collection are two specimens taken May, 1878.

182. *Geothlypis trichas*. MARYLAND YELLOW-THROAT.—Summer resident.

183. *Icteria virens*. YELLOW-BREASTED CHAT.—Summer resident.

184. *Wilsonia pusilla*. WILSON'S WARBLER.—Transient migrant.

185. *Wilsonia canadensis*. CANADIAN WARBLER.—Transient migrant.

186. *Setophaga ruticilla*. AMERICAN REDSTART.—Summer resident. Found breeding along the Choptank June, 1903 (S. N. R.); May 30, 1904 (C. J. P.).

187. *Anthus pensilvanicus*. AMERICAN PIPIT.—Winter resident.

188. *Mimus polyglottos*. MOCKINGBIRD.—Resident. Locally abundant as a breeder as far north as the Delaware and Chesapeake Canal. Usually resident where found.

189. *Galeoscoptes carolinensis*. CATBIRD.—Summer resident. One seen at Lewes, February, 1904 (C. J. P., Auk, April, 1904).

190. *Toxostoma rufum*. BROWN THRASHER.—Summer resident.

191. *Thryothorus ludovicianus*. CAROLINA WREN.—Resident.

192. *Troglodytes aëdon*. HOUSE WREN.—Summer resident.

193. *Olbiorchilus hiemalis*. WINTER WREN.—Winter resident.

194. *Cistothorus stellaris*. SHORT-BILLED MARSH WREN.—Summer resident. Nest and three eggs taken at Newport, June 11, 1886 (C. J. P.).

195. *Telmatodytes palustris*. LONG-BILLED MARSH WREN.—Summer resident.

196. *Certhia familiaris americana*. BROWN CREEPER.—Winter resident.

197. *Sitta carolinensis*. WHITE-BREASTED NUTHATCH.—Resident.

198. *Sitta canadensis*. RED-BREASTED NUTHATCH.—Winter resident.

199. *Sitta pusilla*. BROWN-HEADED NUTHATCH.—Resident. Found only in the lower part of the State, at Seaford, June 18, 1903, a family of 5 or 6 (S. N. R.). One seen at Lewes, Feb. 4-5, 1904 (C. J. P., Auk, April, 1904).

200. *Bæolophus bicolor*. TUFTED TITMOUSE.—Resident.

201. *Parus carolinensis*. CAROLINA CHICKADEE.—Resident.

202. *Regulus satrapa*. GOLDEN-CROWNED KINGLET.—Winter resident.

203. *Regulus calendula*. RUBY-CROWNED KINGLET.—Transient migrant.

204. *Polioptila cærulea*. BLUE-GRAY GNATCATCHER.—Summer resident. Common in summer throughout Sussex County.

205. *Hylocichla mustelina*. WOOD THRUSH.—Summer resident.

206. *Hylocichla fuscescens*. WILSON'S THRUSH.—Transient migrant. One heard July 8, 1903, in deep woods and ravine near Greenville, New Castle County (S. N. R.).

207. *Hylocichla aliciae*. GRAY-CHEEKED THRUSH.—Transient migrant. One from near Wilmington in Bush collection taken Sept., 1877.

208. *Hylocichla ustulata swainsonii*. OLIVE-BACKED THRUSH.—Transient migrant. Bush collection, May, 1878.

209. *Hylocichla guttata pallasii*. HERMIT THRUSH.—Transient migrant.

210. *Merula migratoria*. ROBIN.—Resident.

211. *Sialia sialis*. BLUE BIRD.—Resident.

GENERAL NOTES.

Kumlien's Gull: An Addition to the Massachusetts List.—It has long been supposed that *Larus kumlieni* would prove to be an occasional visitor to the Massachusetts coast. I am glad to be able to report the taking of a specimen by myself at Moon Island in Boston Harbor on February 22 of this year. I first saw the bird February 19, in a large flock of Herring Gulls hovering over and feeding in the sewage discharges into the Harbor at that point. It was identified without much difficulty when flying, by the faint markings of the wings, which at first sight appeared to be immaculate, and the size, slightly less than that of *L. argentatus*. The bird was taken three days later at the same place and is now in the collection of Mr. William Brewster. It is a male in adult plumage with a few very small and indistinct dark spots in the white. The slate-gray markings of the primaries are somewhat darker than in most of Mr. Brewster's other specimens. The establishment of the occurrence of Kumlien's Gull in Massachusetts is especially interesting because its presence here is probably in a sense normal rather than accidental, being simply a southward extension of its usual winter range in a season of unusual severity.—FRANCIS H. ALLEN, *Boston, Mass.*

Leach's Petrel (*Oceanodroma leucorhoa*) on the Long Island Shore.—On October 21, 1904, while walking along the Sound beach off Mt. Sinai Harbor, about six o'clock P. M., I observed a long-winged bird flying low over the waves, a short distance from shore. I shot the bird, which proved to be a male Leach's Petrel. Early next morning, two miles further west on the same beach, I secured a second specimen, which was found to be a young female. Both birds were flying westward when shot. These are

the only cases I know of in which Leach's Petrels have been found so near land. One of the skins is now in my possession; the other is in the collection of Mr. Arthur Helme of Millers Place, L. I. — ROBERT C. MURPHY, *Mt. Sinai, Long Island, N. Y.*

Two Additional Records of the European Widgeon (*Mareca penelope*).—In the 'Wilson Bulletin,' Vol. XI, No. 4, p. 112, under the title 'Notes from Sandusky, Ohio,' Mr. E. L. Moseley writes, without data: "Two specimens of the Widgeon (*Mareca penelope*) were mounted by John Herb this spring."

Through the kindness of Mr. Moseley I am enabled to state that one specimen, a male, was shot by Mr. Edward Hinde on April 18, 1904, some five miles east of Sandusky on the West Huron marsh, which forms an extension of Sandusky Bay. This bird is now in possession of Mr. William Hanson.

The other specimen, also a male, was brought to Mr. Herb, taxidermist, on April 20, 1904, having been shot on Sandusky Bay about two days previous by Mr. Henry Hartung in whose possession it now is. These records make the twentieth for the interior.—RUTHVEN DEANE, *Chicago, Ill.*

An Unusual Migration of Ducks in Ontario.—In February 1899, an unusual inland flight of ducks was noticed in various parts of southern Ontario. Mr. John Boyd has lately placed at my disposal letters relating to this flight, received by him in response to a letter on the subject published in the Toronto 'Globe' of March 10, 1899. These letters, in addition to the notes I already had, are sufficient to show how important and wide-spread the movement was.

During the second week of February ducks were picked up in various parts of Toronto, on the streets, in the freight yards, in open fields in the suburbs, and on the roads leading into the city; they were found principally by the drivers of delivery wagons, and so exhausted were the birds, that in no case did they survive more than a day or two, in confinement.

The species were principally Cowheens (*Marelda hyemalis*), with a few Golden-eyes (*Clangula clangula americana*) and American Mergansers (*Merganser americana*); the species being in about the same proportion as is usual on Lake Ontario in winter. Though a few Bluebills (*Aythya marila*) winter about Toronto none were noticed in the flight and it is possible that they were too weak to attempt it.

I heard of about thirty ducks being found about Toronto, though the number actually taken must have been greater. A Grebe (probably *Colmybus auritus*), was picked up alive a few miles west of Toronto, and this bird survived three days.

At Grimsby, on the south shore of Lake Ontario, about twenty-seven miles west of Niagara Falls, Ont., Mr. Edward Farewell picked up about a dozen dead ducks on the lake shore; of these two were Mergansers, and

four Golden-eyes; he says, " . . . found from ten to twelve, which is an unusual number for this place, as the shore is very open, and ducks very seldom stop here."

At Newmarket, thirty-four miles north of Toronto, and about the same distance south of Lake Simcoe, some ducks were found on the roadside. At Ayr, sixty-eight miles southwest of Toronto and about thirty-five north of Lake Erie, Mr. W. H. Stockton noticed three Cowheens, in February, dead on the ice beside open water in different small streams. At Forest, twenty-three miles east of Saima (at the south end of Lake Huron) and about fifteen from the lake shore, Mr. Montague Smith found, on March 10, a Cowheen dead on a wood pile in the bush. At Exeter, about the same distance from Lake Huron and some miles further north, Mr. William Sweet saw one Cowheen found alive in a barnyard, and one picked up dead in a field; he also saw one on the snow, but it flew away when approached; a Grebe was found alive in some woods. At Depot Harbor, on the Georgian Bay, Mr. J. Kirkwood noticed, about the middle of February, considerable numbers of ducks flying in from the bay and dropping exhausted on the shore, where most of them died. At Beaumauris, on Lake Muskoka (about thirty miles east of the Georgian Bay), Cowheens were reported by Mr. P. A. Taverner as having been found there early in March in an exhausted condition.

The second week of February was marked by a sudden fall of the temperature in Ontario, and ice formed with great rapidity over a much greater area of water than is usual on the lakes, covering the regular feeding grounds, and leaving no open places, as in the case of a slow freeze-up. The ducks finding the regular feeding grounds covered by ice, and being unable to obtain food in the open lake, apparently made a hurried exit with no particular objective except to get away from the Great Lakes; while this seems the most apparent explanation, other reasons connected with the food supply may be possible. A record of the mean temperature at Toronto as given in the meteorological reports from the 7th to the 15th of February show how sudden was the fall of temperature. The mean daily temperature, Fahrenheit, for February 7 to 15, inclusive, was as follows:

Feb. 7	8.24	Feb. 12	— 3.63
" 8	6.75	" 13	— 0.18
" 9	— 1.50	" 14	11.50
" 10	— 5.10	" 15	25.98
" 11	— 5.89		

JAMES H. FLEMING, *Toronto, Canada.*

The Gadwall and Yellow Rail near Springfield, Mass. — *Chaulelasmus streperus*. A Gadwall was taken October 14, 1904, in Glastonbury, Conn., thirty miles below Springfield. Individuals of this species appear in the Connecticut Valley only in very rare instances.

Porzana noveboracensis. Ten years ago, in a certain piece of wet meadow land near Springfield, I captured a Yellow Rail. This was the first and only one that to my knowledge had been observed in this part of the State. One day in the autumn of 1901, at the same place, I found four of this species, and there, later that season and each of the three following autumns, I found others. So little has been known, or at least written, about the Yellow Rail, that I took particular pains to observe them. The place where they were found was wet meadow land covered with wild grass, which in October stood, in places where it had not been harvested, to the height of two or three feet and harbored many Virginia Rails and Soras. The grass upon the other part of the land was cut in the summer, and by the middle of October the second growth reached the height of seven or eight inches, and in this portion the Yellow Rails are to be found, they apparently not desiring so thick a cover as do the common kinds. When the bird is in the air the white spots on the wings make the identification an easy matter. Its flight is much like that of the Sora, although it is apt to rise higher. On alighting it usually immediately secretes itself, but not always, as I have seen it on such occasions run with great rapidity. I have flushed all by the aid of a dog, except one, and that rose about twenty feet ahead of me, evidently frightened by my approach. The earliest date in any autumn that I have found them was the 17th of September, and I think that the latest was the 22d of October. In this part of the Connecticut Valley I have been in many meadows of the same character as the one in question, accompanied by a dog educated in such a way that the scent given out by any kind of rail would so attract his attention that he would be likely to make known the presence of such a bird, if any were there, but in these places I have never found a Yellow Rail, and it seems worthy of note that this species should be a regular autumn visitor to a certain piece of meadow land, containing perhaps three acres, and to be found nowhere else in this vicinity at any time. — ROBERT O. MORRIS, *Springfield, Mass.*

Shore Birds Eating small Fish. — In 'The Auk' for January, 1898 (Vol. XV, p. 51), Mr. H. D. Kirkover records an instance of the Greater Yellow-legs feeding on minnows about an inch and a half in length. While on the island of St. Vincent, West Indies, last October, I observed a number of our shore birds feeding on the young of a small fish known as the 'tri tri' (*Sicydium plumieri*), which were at that time ascending the Richmond River, near which I was staying, by thousands. The land about the lower reaches of this river was laid completely bare by the recent eruptions of the Soufrière, and in its present state proves very attractive to all the species of shore birds which visit the island during the migrations. Those observed or proved by dissection to be eating the young tri tri (which were at that time from half an inch to an inch and a quarter long) were Golden Plover (*Charadrius dominicus*), Turnstones (*Arenaria interpres*), Willets (*Symphemia semipalmata*), Pika, or Greater

Yellow-legs (*Totanus melanoleucus*), Lesser Yellow-legs (*T. flavipes*), Solitary Sandpipers (*Helodromas solitarius*), and Spotted Sandpipers (*Actitis macularia*). All but the last two kept near the mouth of the river, or on the flat land along its lower reaches; the Solitary Sandpiper followed the stream up into what were formerly arrow-root fields, half or three quarters of a mile from the sea, and the Spotted Sandpiper was found well into the mountain forests. — AUSTIN H. CLARK, *Boston, Mass.*

A Killdeer's Mishap. — February 10 last, while watching a large flock of Killdeers on the golf links at Audubon Park, New Orleans, I came upon one of the birds prostrate in an inch of water that had collected in a depression as a result of continued rains. On examining the bird more closely, I found its left leg was protruding into a crayfish hole of about an inch and a half in diameter, and I had literally to tear the bird out to liberate it from its captor, which was most likely a large crayfish. Any more powerful animal, such as a musk rat, a turtle, or a 'blind eel' (*Amphiuma means*), would hardly have mutilated the leg in the way I discovered to be the case when I was able to examine my prisoner critically.

The middle toe was nearly eaten off, while the muscles of the leg below the knee were punctured and rather badly lacerated. How the Killdeer ever made such a mistake as to step into the hole, and how the crayfish, if it was such, had succeeded in catching the agile bird, were mere matters of conjecture with me, but it was evident that the first grip had been upon the toes, and that the captor, then dragging its prey further in, had caught the leg higher up. This was the circumstance that pointed to the crayfish as being the culprit, for the gap between the two points of injury were so far apart, — the length of the tarsus and half the length of the leg below the knee. A large crayfish, with the resistance offered by the sides of its hole, might well have had the grip that seemed at first so astonishing. The bird was drawn down with its breast flush with the ground, further than which, of course, the smallness of the aperture prevented the bird's being dragged. There being nothing at hand with which I could excavate the ground about the hole, I was unable to acquaint myself more fully as to all the circumstances of this strange occurrence, one that must have been cruelly trying to the bird. Further investigation would probably have been useless anyhow, as the captor of the Killdeer, after it had been forced to loosen its hold, no doubt retreated well into its subterranean chambers.

How long the bird had been in this situation was difficult to say. When I released it from its awkward, not to say perilous, situation, it was almost in a state of paralysis, from the combined effects of fear, pain, and being held evidently for some time in the cold water, the day being rather chilly. After I had taken it home, and had cleansed the wound, and kept the bird in a warm room, it soon revived sufficiently to attempt a flight indoors. I kept it overnight, however, and by next morning it had partially recovered the use of the injured foot and leg, and stood upright, even if some-

what wabbly. However, it was otherwise active, and beat its wings strongly when I took it out of the basket where I had kept it all night. There was a little weakness in the first part of its flight when I liberated it from a second story window, but it had soon steadied itself, and flying through the rain towards the Mississippi, was shortly out of sight. — H. H. KOPMAN, *New Orleans, La.*

A Correction. — In my note on 'The Turkey Buzzard in Maine' (Auk, XXII, p. 78.) I stated that the present record made the tenth for the State. I included two specimens which Mr. Boardman added to a revised list which he sent me in 1873. Mr. Ora W. Knight has called my attention to the fact that the title of Mr. Boardman's list 'Catalogue of the Birds found in the vicinity of Calais, Maine,' admits a number of records for the *vicinity* but over the State line, and that Mr. Boardman had informed him by letter that the two buzzards in question were records for New Brunswick. This fact reduces the legitimate number for the State to eight. — RUTHVEN DEANE, *Chicago, Ill.*

The Crab Hawk (*Urubitinga*) in the Island of St. Lucia, West Indies. — On August 2, 1903, I observed and identified an example of *Urubitinga anthracina* (Licht.) near the town of Soufrière, St. Lucia, British West Indies. There are, I believe, no other records for the island, although the bird very possibly is resident in the highlands of St. Lucia, as it is on the neighboring island of St. Vincent, as St. Lucia is comparatively little known ornithologically. On the other hand, the bird may have strayed from St. Vincent during the late eruptions, as did great numbers of Ramier (*Columba squamosa* Bonn.) which at that time visited the island of Grenada. — AUSTIN H. CLARK, *Boston, Mass.*

Scott's Sparrow in Colorado. — While engaged in field work for the Biological Survey in the fall of 1903, I collected an immature male Scott's Sparrow (*Aimophila ruficeps scottii*) at Trinidad, Colorado — the first record for the State. It was taken September 17, 1903, on a piñon ridge near the city, and was evidently migrating southward at the time. — ARTHUR H. HOWELL, *Washington, D. C.*

Nelson's Sparrow in Nebraska. — On the 8th of October last I collected the first specimen of Nelson Sparrow (*Ammodramus nelsoni*) in this State. It was a young male and was a member of a flock of about a dozen birds mingled with great numbers of Leconte and Grasshopper Sparrows, in a marsh surrounding a pond northeast of this city. The birds were shy, only occasionally mounting to a weed-stalk or grass-stem for a moment to take a look at the intruder; and no note was heard but a low *chip*, not distinguishable from the notes of the associated species. — ROBERT H. WOLCOTT, *Lincoln, Nebr.*

A Female Cardinal Wintering in Concord, Mass. — Mrs. Russell Robb of Concord gives me permission to record the presence of a female Cardinal (*Cardinalis cardinalis*) on her place on Punkatasset Hill. The bird was first seen on the 28th of January, 1905, and on February 23 is still about. During the winter months when the days were short the bird would come to be fed at nine in the morning and early in the afternoon. Now that the days are longer it comes by six A. M., and in the afternoon not until four.

This is the second female beside the one that bred in Cambridge, to be noted in Massachusetts. — REGINALD HEBER HOWE, JR., *Concord, Mass.*

Decrease of Purple Martins on Long Island, N. Y. — Seeing a note on Purple Martins in Concord, Mass., a short time ago in 'The Auk,' I thought the following might possibly be of some interest. Three summers ago, Purple Martins (*Progne subis*) were very common at Quogue, L. I., and bred in boxes erected for their occupation. The summer of 1903 they had decreased in number, and last summer they had disappeared apparently from the locality. I am afraid English Sparrows took possession of their boxes.

The summer of 1903, I killed a Black-breasted Plover (*Squatarola squatarola*) on July 1, as recorded in 'The Auk' (XXI, p. 79). Last summer I saw one on July 6, with a very black breast, but unfortunately missed him. Snipe and Plover were exceedingly rare all last summer. — F. W. KOBBE, *New York City.*

The Loggerhead Shrike in Connecticut in Winter. — I am indebted to Mr. Wilbur F. Smith, of South Norwalk, Conn., for the opportunity of recording the capture of a very dark-colored specimen of the Loggerhead Shrike (*Lanius ludovicianus*) taken at South Norwalk, Conn., on February 17, 1905, and brought by him to me for identification. The bird was found wounded by the roadside, and brought alive to Mr. Smith, but died soon after being taken into the warm air of a house from a temperature of nearly zero out of doors. This may have hastened the bird's death, although it had lost one eye and the left half of the tail, and was found on dissection to have received severe internal injuries.

As there are several winter records for the Northern Loggerhead Shrike (*L. l. migrans*) in southern and middle New England, the chief interest in the present connection is the exceptionally dark coloration of the specimen, which is very much darker even than the darkest Florida specimen I have ever seen. The upper tail-coverts were nearly as dark as the back; the lower parts were as dark gray as is the back in an average specimen of *ludovicianus* from Florida or the Gulf States, while the upper parts were many shades darker; even the throat, lower tail-coverts, and the tips of the rectrices were strongly grayish white instead of clear white, as in ordinary specimens. The bird is thus strikingly darker than *migrans*, being, as said above, darker than even very dark specimens of

ludovicianus, and for this reason is referred to the latter form. — J. A. ALLEN, *Am. Mus. Nat. Hist., New York City*.

Parula Warbler and Short-billed Marsh Wren. — In referring to the Parula Warbler and Short-billed Marsh Wren in the January issue Mr. Swales has left the impression that these birds are very rare in Wayne County, Michigan. His records represent the first specimens taken but not the first observed. I have seen the Parula here at various times during both spring and autumn. The specimen I secured, and mentioned by Mr. Swales, is typical of Ridgway's *C. a. ramalinae*.

The Short-billed Marsh Wren is a summer resident but not common and no eggs have been taken in this immediate vicinity, probably because no local oölogist has devoted especial attention to the species. In Ecorse Township, on May 27, I found two nests in a small inland swale covered with fine marsh grass interspersed with bush clusters. The greatest depth of water at that time was about one foot, but this swale is perfectly dry from July to November, except during short periods after heavy rains. The nests were fastened to the marsh grass only a few inches above the water. They were composed of fine grasses and were without lining, being either the well known false nests or good ones not yet completed. I drove one of the birds out of the grass and into a bush where he remained for some time not more than five feet from me. My next visit was September 11, but no birds were seen in the marsh. However, one was discovered in a thick weed tangle on the bordering high ground. — J. CLAIRE WOOD, *Detroit, Michigan*.

A Supposed Specimen of the Yellow Warbler (*Dendroica aestiva*) from Grenada, West Indies. — Mr. Ridgway (Birds No. and Mid. America, II, p. 510, 1902) gives *Dendroica aestiva* (Gmel.) as having occurred in Grenada. His words are: "No certain record from West Indies, except Grenada, but doubtfully credited to Bahamas and Cuba." In the distribution of the subspecies *D. æ. aestiva* he includes Grenada, "one specimen, November 14, 1882, in U. S. National Museum collection."

Through the kindness of Dr. C. W. Richmond I have been enabled to examine the bird in question. The label attached to the skin reads: "Shot on a mangrove tree on border of swamp at Telescope, 14th Nov. 1882. Only 2 seen." This is in the writing of the late Mr. John Grant Wells, by whom the bird was taken. The name of the bird as given on the label is "*Dendræca peteckia*," but the name "*peteckia*" is crossed out and "*aestiva*" written above it. The dimensions of the bird (which is an immature male) are given on the label as "4½ inches, 7½ inches, and 2½ inches."

In Proc. U. S. Nat. Mus., IX, 1886, p. 611, in a list of the birds of Grenada we find: "No. 5. *Dendroica peteckia* (Linn.). Yellow Bird.

"♂; Length, 4½ in., expanse, 7½ in., wing, 2½ in.

"Not numerous; very shy; frequents the mangrove trees near to the swamps or windward side of the island."

The occurrence of "*D. peteckia*" in Grenada was apparently based on this specimen, if one can judge from the dimensions given on the label of the bird and their correlation with those in the text; the locality given in the article and that on the label (Telescope is on the windward side of the island); the fact that the bird was originally labelled "*D. peteckia*"; and the fact that in writing up the species Mr. Wells gave it the local name of "Yellow Bird," which name is also on the label in his handwriting.

This one specimen, therefore, represents two records; Lawrence records "*D. peteckia*" from Grenada, and Mr. Ridgway *D. æstiva* on the evidence of it alone.

Now *Dendroica ruficapilla* occurs as a resident in the swamps of Grenada, Carriacou, Union Island, and Prune Island (Grenadines), and is probably the bird referred to by Lawrence and Wells as "*D. peteckia*."

With the assistance of Mr. Outram Bangs I tried to determine whether this bird was an example of *D. ruficapilla* or of *D. æstiva*. It is an immature male, with the coloration of the female. In size it is identical with specimens of *D. æ. æstiva* in Mr. Bangs's collection, and also with specimens of *D. ruficapilla* obtained by myself on Prune Island and on Carriacou. The pileum is of the same color as the back as in the adult females of *D. æstiva*; but one example of *D. ruficapilla* which I obtained in Carriacou (an immature male) also shows this character, and I have seen it in birds of that species from Dominica. There is, therefore, absolutely no way of distinguishing between the young of these two species, either by coloration or size.

From the following circumstantial evidence, however, it seems clear to me that the bird in question is an example of *D. ruficapilla* and not of *D. æstiva*.

Although it appears not to have been previously known, *D. ruficapilla* occurs, as a rather rare resident, in the swamps on Grenada, especially on the windward side. Telescope (near Grenville) is one of the localities in which it is found. Unless one is familiar with the retiring and shy character of this bird, it is very easily overlooked, which probably accounts for the fact that no collectors ever previously obtained it on Grenada or the Grenadines. It is far more often heard than seen. The greatest number which I ever obtained in a single day was two, the result of wading about knee deep in mud and water in the midst of a mosquito infested mangrove swamp from sunrise to sunset. Mr. Wells, who recently died, at the age of fifty-eight years, lived all his life in Grenada, except for eleven years spent in Carriacou. He never took but a single Yellow Warbler in his life, and does not record the species from Carriacou, although my specimens all came from a swamp within gunshot of his residence.

I believe, therefore, that we had best exclude *D. æstiva* from the avifauna of the West Indies for the present, until a bird referable to that species is taken on St. Vincent, or on some island which has no resident yellow

warbler, or which has a species which may be distinguished from *D. aestiva* in all its forms.—AUSTIN H. CLARK, *Boston, Mass.*

Breeding of Wilson's Thrush (*Hylocichla fuscescens*) in Virginia.—“Northern New Jersey and the northern part of the Lake States northward” is the breeding range of Wilson's Thrush (*Turdus fuscescens* Steph.) as outlined in the A. O. U. Check-List. There does not appear to be any record of the breeding of this species further to the southward. It therefore gives me pleasure to record the fact that on June 25, 1903, while on a collecting trip in my interest to Mt. Rogers (5,719 ft.), Grayson County, Virginia, Mr. Harvey G. Davis found a nest of this species containing three eggs, which, together with the parent birds, is in my collection. This record definitely establishes the breeding range of this species as including the higher mountain region of Virginia. It is probable that this species breeds also in the mountains of North Carolina, but this fact does not seem to be yet established.—JOHN W. DANIEL, JR., *Lynchburg, Va.*

Notes on the Nesting of the Varied Thrush.—The following notes on the nesting of the Varied Thrush (*Ixoreus naevius*) in southern British Columbia may be of interest, as most of the published records are from more northern latitudes.

During the Spring of 1903 I had a good opportunity to note their nesting habits, while running a line of bear traps at the base of Cheam Peak on the lower Fraser River, altitude about seventy feet above sea level.

The birds were found nesting in heavy coniferous forest of very tall timber, with very little undergrowth for the coast district, where dense brush is the rule.

The nesting site was usually a small tree heavily draped with the rank growth of green moss which grows in such profusion in these dark woods. Five nests were taken on the following dates:

28th April. Three eggs, incubation slight. Nest in small hemlock, nine feet from ground, saddled on limb close to trunk, composed of green moss, twigs and rootlets, in a loose foundation of larger twigs, and lined with shredded cedar bark.

3d May. Three eggs with large embryos. Nest in moss-covered spruce, on dead limb ten feet from ground. Nest same as last but lined with fine dry grass, with a few dead leaves in outer structure.

3d May. Three eggs with small embryos. Nest in leaning cedar nine feet from ground; structure and lining same as preceding.

7th May. Three eggs, nearly fresh. Nest in vine maple (*Acer circinatum*), nine feet from ground.

16th May. Four eggs, fresh. Nest in the pendant branch of a large cedar, twelve feet from ground. The last may have been a second laying, as I noticed the birds were breeding there two weeks previously.

Three eggs seems to be the average, as two nests I have taken in previ-

ous years had two and three eggs respectively. The former was a full clutch, as the bird was sitting.

The outside structure of the nests being principally green moss made them comparatively inconspicuous, in spite of their large size, as they were usually saddled on a limb that was completely covered with the same moss.

There is generally a considerable admixture of damp leaf mold in the foundation of the nest, but not in the walls. The average dimensions are about six and a half inches for outside diameter, and three and a half across the cavity.

The ground color of the eggs is rather lighter than in those of *Merula migratoria*; the spots vary from raw umber to dark sepia, and are usually rather sparsely scattered, rather denser towards the larger end but never forming a distinct zone.

The shape is usually a long oval. One set (3) seems to present the extreme variation in size, the eggs measuring $1.20 \times .80$ in., $1.21 \times .72$, and $1.15 \times .73$ inches.

In no instance were two pairs of birds found breeding near each other; the nests were about half a mile apart. The proximity of the nest is usually betrayed by the actions of the birds, which flutter from tree to tree uttering a peculiar chatter not heard at other times.

Before closing these disjointed notes it might be as well to record the irruption of the Varied Thrush during the present winter (1904-05). During other winters a few may be seen, even in the coldest weather, throughout the district west of the Cascades. This winter they fairly swarm; and reports from Okanagan show they are even wintering in the cold interior of the Province. Large numbers of Audubon's Warbler are also wintering in the lower Fraser Valley, though the winter is a fairly severe one. — ALLAN BROOKS, *Sumas, B. C.*

An Unrecognized Subspecies of *Bellona cristatus*. — In his 'Descriptions of New Species of Birds of the Families Trochilidæ and Tetraonidæ, (Ann. N. Y. Acad. Sci., I, p. 50, 1877) Mr. Lawrence described a new hummingbird under the name of *Orthorhynchus emigrans* as follows:

"*Male*. — The basal half of the crest is of a shining emerald-green, the terminal half deep reddish-violet; the upper plumage is dark grass-green; tail-feathers blackish-purple, the two central ones washed with green; quills light purple; throat smoky-gray; breast and abdomen smoky-black; bill and feet black.

"Length, $3\frac{1}{4}$ in.; wing, $1\frac{1}{8}$; tail, $1\frac{1}{8}$; bill from termination of frontal feathers, $\frac{7}{8}$

"A younger specimen, but with the crest fully developed, has the throat whitish-ash, and the outer two lateral feathers [rectrices?] tipped with the same. . . .

"*Habitat*. — Venezuela. Type in my collection. [Now in the American Museum of Natural History, New York.]

Remarks.—This is a close ally of *O. cristatus* from Barbadoes; the two colors of the crest are equally divided in both, but they differ in shades of coloring; the green in the new species is without the strong golden tinge existing in the other, and the violet is rather deeper in color, which color it retains in all positions — whereas in some lights that of *O. cristatus* is greenish; the upper plumage of the latter is lighter and of a golden-green; the new species is also rather smaller, with a longer bill. They differ strikingly in the ends of the tail-feathers, these being obtusely pointed in the new species, and rounded in the other."

On working up a large series of these hummingbirds from Barbados, the Grenadines, and Grenada, the difference between those from Barbados and those from the other islands at once struck me, and I found that the above description of *O. emigrans* exactly fitted the Barbados bird. Although Linnæus's type of *Trochilus cristatus* probably came from Barbados (as that island was at that time much better known), there is nothing to make us absolutely sure, and his description (Syst. Nat., I, p. 192, 1766) is applicable to either form. Lawrence's description, on the other hand, could not have been taken from a Grenada specimen, as he brings out the characters which my study of a large series collected by myself on Barbados and others from Grenada and the Grenadines have shown separate the two forms. His locality "Venezuela" is undoubtedly erroneous, as the genus is purely West Indian, occurring only from Porto Rico south to Grenada. The fact that he compares his new species with a specimen from "Barbadoes" is of no significance, as Barbados is the great shipping port of these islands, where merchandise is transhipped from intercolonial craft (trading between the less important colonies) to ocean going boats.

The coloration of the crest of this hummingbird, in common with the metallic colors of many other species, changes somewhat with age (after death), but in a series of fresh specimens the differences exhibited between the birds from these two localities is very marked. I have not been able to examine any old skins from Barbados, but I have no doubt that could be instantly distinguished (by the more violet color of the posterior half of the crest) from others from Grenada or the Grenadines.

Bellona cristatus will therefore stand, with its two forms, as follows:—

Bellona cristatus (Linn.).

HABITAT. Barbados, the Grenadines, and Grenada.

Bellona cristatus cristatus (Linn.).

HABITAT. The Grenadines and Grenada.

Bellona cristatus emigrans (Law.).

HABITAT. Barbados.—AUSTIN K. CLARK, *Boston, Mass.*

Michigan Randoms. — (Opened the oölogical season with a set of two eggs of the Great Horned Owl on March 1, followed by three of the Bald Eagle on the 13th; then the usual run of Red-tail, Red-shoulder, Cooper's, Sparrow Hawk, etc., during April and May, and a "wind up" with the Warblers in June, the rarest find being two sets of Cerulean.

Henslow's Sparrow is of regular occurrence as a fall migrant ; in fact, can always be found in suitable localities during that period. Have observed it only twice in spring ; but this is no indication of rarity, having never really looked for it.

Lincoln's Sparrow cannot be considered rare. Met with it on the three days afield in September ; also October 2 and 9.

Connecticut Warbler. — Secured an immature bird on October 6 in Ecorse Township. This is the second record, Mr. P. A. Taverner taking the first specimen in Greenfield Township.

Red-throated Loon. — May 9 I had the pleasure of examining an adult male on Grosse Isle, Monguagon Township. It was shot by a Frenchman who invited me down to inspect a "Red-throated Hell-diver."

Blue-winged Teal. — Was on Elba Island, Monguagon Township, June 20-24, and noted a male in the marsh throughout my stay. The female was noticed but once and only for a short time, from which I conclude she was incubating. In 1886-87 I saw parents followed by young in a marsh just below the city in what is now known as the Village of River Rouge. Black-crowned Night Herons were also common about this same marsh at that time, but I have seen none since the summer of 1890.

American Merganser. — A pair spent the summer in the vicinity of Elba and Hickory Islands. Noted them on several visits during June, July and August.

Passenger Pigeon. — While woodcock shooting in October I was joined by a soldier from the fort who stated he shot several of these pigeons in September from a flock of about twenty. They were feeding on beech nuts in a large woods near Orchard Lake, Oakland County. This has a ring of truth about it. The last seen by me in Wayne County was in Greenfield Township, on March 21, 1890, and the very last was a pair near Corunna, Michigan, on May 10, 1892.

Bob-white. — The severe winter of 1903-04 nearly exterminated the Bob-white. One farmer told me that of about twenty on his farm in November, not one was left the following spring.

A notable feature of the autumn migration was the unusual abundance of Gray-cheeked Thrushes and Fox Sparrows and the total absence of Tennessee Warblers.

Except as otherwise stated, the above randoms refer to Wayne County and the season of 1904. — J. CLAIRE WOOD, *Detroit, Michigan*.

Erroneous Maine Records. — During the past seven years it has repeatedly been necessary to call the attention of ornithological writers to the fact that many of the birds recorded in Mr. George A. Boardman's lists were taken on land and waters within the British dominion and are not entitled to be listed as birds of Maine and New England. Mr. Boardman's original list (*cf.* Proc. Boston Soc. Nat. Hist., Vol. IX, pp. 122-132) by its very title, 'Catalogue of the Birds Found in the Vicinity of Calais, Maine, and about the Islands of the Bay of Fundy,' shows that he did not

intend to limit it to a consideration of Maine taken species because he added to the first portion of the title 'and about the Islands of the Bay of Fundy.' In many of Mr. Boardman's writings exact localities where specimens were taken, such as Grand Menan, Indian Island, St. Stephen, were given; but in spite of this subsequent writers have called such records Maine records, and cited the specimens recorded as being taken in Maine.

In 1896-97, when preparing the manuscript of 'A List of the Birds of Maine' for publication, Mr. Boardman and I desired to have his records straightened out, as he realized he had been *persistently misquoted* by many ornithologists of note. Accordingly Mr. Boardman went carefully over all his records, and all entitled to be cited as birds of Maine are given *completely and correctly*, as I was assured by Mr. Boardman, in 'A List of the Birds of Maine,' while in the hypothetical list at the end of this work reason for excluding many of the species previously accredited to Maine, owing to the misquoting of Mr. Boardman, is given.

Writers in the future should be careful not to accredit any species to Maine upon the authority of quotations from Mr. Boardman's lists, or on other authority directly or indirectly derived therefrom, unless such species is given in the publication above referred to, or unless other positive information of more recent date is at hand. It is perhaps well at this stage to call the attention of ornithologists to the fact that Mr. Boardman published a list entitled 'St. Croix Birds' and other scientific lists in the Calais 'Weekly Times' between November 23, 1899, and February 5, 1900. I wish to especially emphasize the fact that this St. Croix List is not confined in its enumerations to Maine specimens, and that it does not purport to be anything other than what the title taken in its very broadest sense would indicate, and that consequently many species recorded there were taken or seen in New Brunswick.

Though, as stated in the beginning, the attention of ornithological writers has been called to the facts herein stated more or less frequently, yet the erroneous citation of Mr. Boardman's records by two writers within the past month would indicate that many are still in ignorance of the facts in the case. — O. W. KNIGHT, *Bangor, Maine*.

Swainson and Audubon.—The letter of Swainson to Audubon in 'The Auk' for January, 1905 (XXII, p. 31-34) solved a problem that perplexed me in 1900 while writing a biography of Swainson. I assumed that Swainson's letter of "2d October 1830" (see Auk, Jan., 1898, p. 11-13) might have been an answer to Audubon's of "22 Aug. 1830," inasmuch as no subsequent letter from Audubon earlier than "6 June 1831" was in the Linnæan collection (see Osprey, V, 24). The letter of Swainson published by Mr. Ruthven Deane, however, shows that such was not the case. It is now clear that Audubon made his proposition for limited partnership while in Manchester, in his letter dated "22 Aug. 1830"; to this Swainson responded in his letter dated "Thursday." (Thursday of August in 1830

fell on the 26th.) To this Audubon must have replied, but his letter is missing from the Linnæan collection. To that lost letter Swainson's letter of "2d October 1830" undoubtedly is an answer. The letters are published in the following Journals:

1830, Aug. 22 (Manchester). Audubon's letter proposing coöperation, etc. (Synopsis in Proc. Linn. Soc., London, May 22, 1900, p. 26; republished in Osprey, IV, p. 24)

1830, Aug. 26. Swainson's letter (undated) published in Auk, XXII, pp. 32-34.

1830, Aug. 29. Audubon's letter in reply to last: apparently lost.

1830, Oct. 2. Swainson's letter in answer to last, published in Auk, XV, 1898, pp. 11-13; republished in Osprey, IV, p. 171, V, pp. 8, 9.

Let us hope that the editor of 'The Auk' will procure a copy of Audubon's letter of Aug. 22 and publish it. — THEO. GILL, *Washington, D. C.*

RECENT LITERATURE.

Ridgway's 'The Birds of North and Middle America,' Part III.¹—The first 500 pages—rather more than half—of the present volume, we are told in the preface, "were printed during the year 1903," when it became necessary to suspend the printing until July, 1904; its publication was

¹ The Birds | of | North and Middle America : | A Descriptive Catalogue | of the | Higher Groups, Genera, Species, and Subspecies of Birds | known to occur in North America, from the | Arctic Lands to the Isthmus of Panama | the West Indies and Other Islands | of the Caribbean Sea, and the Galapagos Archipelago. | By | Robert Ridgway, | Curator, Division of Birds. | — | Part III. |

Family Motacilladæ — The Wagtails and Pipits.

Family Hirundinidæ — The Swallows.

Family Ampelidæ — The Waxwings.

Family Ptilogonatidæ — The Silky Flycatchers.

Family Dulidæ — The Palm Chats.

Family Vireonidæ — The Vireos.

Family Laniidæ — The Shrikes.

Family Corvidæ — The Crows and Jays. |

Family Paridæ — The Titmice. |

Family Sittidæ — The Nuthatches. |

Family Certhiidæ — The Creepers. |

Family Troglodytidæ — The Wrens.

Family Cinclidæ — The Dippers. |

Family Chamæidæ — The Wren-Tits. |

Family Sylviidæ — The Warblers | —

| Washington : | Government Printing Office, | 1904. = Bulletin of the United States National Museum, No. 50, Part III. 8vo, pp. i-xx + 1-801, pll. i-xix.

thus delayed much beyond the anticipated date when Part II was issued, only a few advance copies in paper covers being distributed during the last days of 1904. It includes about the same number of pages as Part II, and almost exactly the same number of species and subspecies, namely 434, as compared with 433 in Part II. As the general character of the work has been indicated in our review of Part I (Auk, XIX, Jan., 1903, pp. 97-102) we have now merely to note the contents of Part III, which includes the following 15 families.

(1) Motacillidæ, with 3 genera and 8 species; (2) Hirundinidæ, 12 genera and 32 species and subspecies; (3) Ampelidæ, 1 genus and 2 species; (4) Ptilogonatidæ, 3 genera and 5 species; (5) Dulidæ (wholly West Indian), 1 genus and 2 species; (6) Vireonidæ, 8 genera and 78 species and subspecies; (7) Laniidæ, 1 genus and 21 species with 6 additional subspecies; (8) Corvidæ, 13 genera and 83 species; (9) Paridæ, 4 genera and 36 species and subspecies; (10) Sittidæ, 1 genus and 10 species and subspecies; (11) Certhiidæ, 1 genus and 6 subspecies; (12) Troglodytidæ, 17 genera and 135 species and subspecies; (13) Cinclidæ, 1 genus and 3 species and subspecies; (14) Chamæidæ, 1 genus and 4 species and subspecies; (15) Sylviidæ, 3 genera and 22 species and subspecies. These statistics include the 5 subspecies added in the Addenda.

Four genera, 1 species, and 14 subspecies are described as 'new,' mostly in the first half of the volume, but only one appears to have been really new at the time of its publication, the others having been published elsewhere before the volume was completed, and thus antedate by nearly a year the date of Part III. Their real place of publication, however, is duly stated in the addenda, and attention is called to the fact in the 'Table of Contents.'

The genus *Polioptila*, provisionally referred in Part I (pp. 18 and 23) to Mimidæ, here finds a resting place in the Sylviidæ, forming a subfamily Polioptilinæ. The only alternative, Mr. Ridgway believes, is to make the group a separate family.

To take up the nomenclature of the work somewhat in detail with special reference to the A. O. U. Check-List, it is to be noted that *Neocorys* is considered as not entitled to even subgeneric recognition; *Vireosylva* and *Lanivireo* are given full generic rank; *Cractes* Billberg (1828) is made (in the addenda, p. 750) to replace *Perisoreus* Bonaparte (1831); *Penthestes* unfortunately has to take the place of *Parus*, which is restricted to the Old World, with *Parus major* as the type. On the whole this is a very slight disturbance of our current generic nomenclature.

In respect to species and subspecies, the status of a few forms is changed; a number of forms rejected by the A. O. U. Committee have been admitted, but in most instances its decisions are confirmed. A curious case, however, is that of "*Bæolophus atricristatus sennetti*, subsp. nov.," which takes the place of both *Bæolophus bicolor texensis* (Sennett) and *B. atricristatus castaneifrons* (Sennett), which are ruled out as

'hybrids' between *B. atricristatus sennetti* and *B. bicolor*, and are thus "without nomenclatural standing"! The 'hybrid' theory is not here for the first time invoked by our author as an easy way to clear up a knotty case, as witness his treatment in Part I of *Junco annectens* Baird, *J. ridgwayi* Mearns, etc., and in other instances on earlier occasions.

Further changes among the Titmice include *Bæolophus inornatus murinus* as a new subspecies from southern California and northern Lower California; *B. wollweberi* is restricted to the highlands of Mexico, and the United States form takes the name *B. w. annexus* (Cassin). *Parus* (or *Penthestes*) *carolinensis impiger* of Bangs is added, as is also *P. hudsonicus littoralis*, while *P. h. stoneyi* is referred to *hudsonicus*. *Psaltiriparus minimus saturatus* is described as new from the Puget Sound region.

The range of *Corvus corax clarionensis* is extended northward to include the Santa Barbara Islands, and is thus brought within our Check-List limits. *Corvus brachyrhynchos hesperius* is revived, and *C. caurinus* is reduced to a subspecies of *C. brachyrhynchos*. *Cyanocitta stelleri borealis* is not recognized while *C. s. carbonacea* is, although the former is quite as good a form as the latter.

Among the Wrens are many additions of forms recently denied admission to the Check-List, as *Telmatodytes palustris thryophilus*, *Thryomanes bewickii eremophilus*, *T. b. cerroensis*, *T. b. nesophilus*, *T. b. drymæcus*, and *Catherpes mexicanus polioptilus* while, on the other hand, *T. leucophrys* is reduced to a subspecies of *T. bewickii*, and *Troglodytes ædon aztecus* is made a synonym of *T. a. parkmani* and the range of the latter continued eastward to Indiana. *Salpinctes obsoletus pulverius* is also admitted, and *S. guadalupensis* is reduced to a subspecies of *S. obsoletus*.

The American Dipper takes the name *Cinclus mexicanus unicolor* (Bonap.), typical *mexicanus* being restricted to Mexico and Guatemala. All the hitherto described forms of *Chamæa* are admitted, and *Regulus cuvierii* ranks as a good species on the basis of a single record and the "type lost"; in other words, on the description and drawing of a specimen alleged to have been taken near Philadelphia nearly a century ago.

The 'Addenda,' as often happens, forms an important part of the volume. It not only contains many overlooked references which are to be added to the tables of synonymy, but many references to publications that appeared during the printing of the volume, and especially after the printing of the first half, among which, as already noted, are references to the publication of the genera and subspecies indicated as new in the main text; and it also includes a number of additional subspecies and changes of nomenclature. Attention is called to most of these, by footnotes or otherwise, in the table of contents, but the table of contents is not to be taken as giving the nomenclature of the species as finally modified in the addenda; for there are no footnote references to guide the unwary to such changes as that of *Corvus americanus* to *Corvus brachyrhynchos*, or the substitution of *Cractes* for *Perisoreus*, as one would naturally expect.

Part III is of course uniform with the preceding parts in execution, showing the same painstaking attention to details of citation in the synonymies, and care and thoroughness in elaboration, and is invaluable as an exponent of our present knowledge of the fifteen families of birds embraced within its scope, as represented in North and Middle America. It brings up the total number of families treated to 20, of genera to 216, and of species and subspecies to 1256, and includes more than three fourths of the Oscines of the region.

Part IV, which is about half completed, will contain the remaining families of the Oscines and the Tyrannidæ, Pipridæ, and Cotingidæ. We trust the author's present change of scene through a long vacation trip to the mountains of Costa Rica will give him renewed energy and zeal for the completion of this great task, already so well advanced.—
J. A. A.

Richmond on Birds described by Pallas in 1764.—In 1764 appeared a sale catalogue of natural history specimens published by A. Vroeg, to which was added a separately paged supplement in which were described 38 species of birds by P. S. Pallas. A transcript of this appendix, by C. Davies Sherborn, has just been republished under the title 'The New Species of Birds in Vroeg's Catalogue, 1764.'¹ This 'Catalogue' is so rare, says Mr. Sherborn, that the only copy he has seen "is preserved among Linnæus' collection of books in the library of the Linnæan Society of London. The new species of birds," says Mr. Sherborn, " (there are no other new species) are collected at the end of the *Catalogue* in a separately-paged 'Adumbratiuncula,' and as these new species are properly diagnosed the Linnæan Society has kindly consented to a reprinting of the pages. The reprint follows the original, line for line, the only addition being the localities, which have been added from the entries in the *Catalogue* to which the numbers prefixed to each item refer." Mr. Sherborn states that there is no clue to the author of these names, but Dr. C. W. Richmond has found that the author was P. S. Pallas, and that Linnæus cited some of these names in the twelfth edition of his 'Systema Naturæ,' 1766, as from "*Pallas. adumbr.*" etc., and says (*l. c.*, p. 342 inedit.) "without doubt Linnæus was indebted to Pallas for his copy of the *Catalogue*."

Following Mr. Sherborn's reprint of the 'Adumbratiuncula,' Dr. Richmond² gives the modern equivalents of Pallas's names. He says: "This separately-paged portion of the *Catalogue* contains descriptions of thirty-

¹ The New Species of Birds in Vroeg's Catalogue, 1764. By C. Davies Sherborn. Smithsonian Miscel. Coll. (Quarterly Issue), Vol. XLVII, p. 332-341, Jan. 31, 1905.

² Notes on the Birds described by Pallas in the "Adumbratiuncula" of Vroeg's Catalogue. By Charles W. Richmond. *Ibid.*, pp. 342-347.

eight species, thirty-five of which were supposed to be additional to the tenth edition of the *Systema Naturæ*. Although his name does not appear in connection with it, the 'Adumbratiuncula' was written by Peter Simon Pallas, as he tells us in his *Zoographia Rosso-Asiatica* (II, p. 199), a statement long anticipated by Linnæus in the 1766 edition of the *Systema Naturæ*, when '*Pallas. adumbr.*' is quoted in the synonymy of several species." Although anonymous, the authorship of the 'Adumbratiuncula' is thus not in doubt, nor is this the first time it has been cited as Pallas's work.

For 16 of these species Pallas's names appear to have priority, while 4 are not positively identified, and of the remainder 16 have earlier names, and two are synonyms of other species here described. The only North American species affected is the Sanderling, which should apparently be called *Calidris alba* (= *Trynga alba* Pallas, 1764 = *Tringa arenaria* Linnæus, 1766.—J. A. A.

Harvie-Brown and Macpherson's 'A Fauna of the Northwest Highlands and Skye.'¹—This is the ninth volume, in order of publication, of 'The Vertebrate Fauna of Scotland,' by J. A. Harvie-Brown and Thomas E. Buckley, some of which have been noticed in previous volumes of 'The Auk.'² The first hundred pages are chiefly historical and topographical; mammals occupy forty-eight pages, birds something over three hundred, the reptiles and amphibia about three, and there are about ten pages of supplemental matter, and the Index. Like all the volumes of this series, it is beautifully printed and illustrated, the illustrations including a number of maps, many beautiful full-page plates from photographs, principally of scenery and the breeding places of birds, but they include also several portraits of prominent Scotch naturalists, now deceased, and numerous text cuts, of scenic or historic interest. There are biographical sketches of two of Mr. Harvie-Brown's colleagues,—Mr. Thomas E. Buckley and Rev. H. A. Macpherson,—recently deceased, the former having been joint author with Mr. Harvie-Brown of 'The Vertebrate Fauna of Scotland' series, while the latter was co-author of the volume here under notice, and also author of 'A History of Fowling,' noticed in 'The Auk' for January, 1900 (XVII, pp. 85, 86), and of other standard works. Both are well known authorities on the natural history of Scotland and the north of England.

The present volume, like its predecessors, shows exhaustive research and patient, conscientious labor, and cannot fail to be of great local inter-

¹ A Fauna of the Northwest Highlands and Skye. By J. A. Harvie-Brown and Rev. H. A. Macpherson. Edinburgh: David Douglas. 1904. Sm. 4to, pp. i-civ + 1-378, maps, numerous plates and text illustrations from photographs. Price 30s.

² See e. g., 'A Fauna of the Moray Basin, Auk, XIII, 1896, pp. 351, 352.

est and a record of present and past conditions that will be of ever increasing historic value as time passes.— J. A. A.

Proceedings of the Delaware Valley Ornithological Club.— 'Cassinia' for 1904¹ appears promptly with its 80 pages of articles and notes on the "Ornithology of Pennsylvania, New Jersey and Delaware," including an 'abstract of the proceedings' of the Club for 1904. The first paper, by Witmer Stone, is a biographical notice of the late Dr. Samuel W. Woodhouse, with portraits, the text of the article being in substance the same as Mr. Stone's notice of Dr. Woodhouse in 'The Auk' for January, 1905, but fuller in respect to details. The frontispiece is an excellent likeness of Dr. Woodhouse as he appeared in his later years, while in addition two early portraits are given and a view of one of the camps of the U. S. Topographical Engineers, in the Indian Territory in June, 1850, with Dr. Woodhouse and other officers in the foreground, from daguerreotypes.

Other papers are: (2) 'A Chimney Swift's Day,' by Cornelius Weygandt, giving a day's observations of a family of Swifts, describing in detail their manner of entering and leaving their chimney quarters, etc.; (3) 'That Feathered Midget of our Tide-water Swamps—the Long-billed Marsh Wren,' by Chaswell J. Hunt; (4) 'The Short-billed Marsh Wren (*Cistothorus stellaris*) in Eastern Pennsylvania and New Jersey,' by LaRue K. Holmes; (5) 'The Barn Owl (*Strix pratincola*) in Chester County, Pennsylvania,' by Thomas H. Jackson, with plate from life, showing old and young birds; (6) 'Summer Birds of Pocono Lake, Munroe County, Pennsylvania,' by John D. Carter; (7) 'Summer Birds of Port Alleghany, McKean County, Pennsylvania,' by Thomas D. Keim,—an annotated list of about 70 species; (8) 'A Glimpse of Winter Bird Life in Delaware,' by Charles J. Pennock; (9) 'Report on the Spring Migration of 1904,' by Witmer Stone—based on 50 schedules, the results being given in tabular form by localities, followed by a supplementary annotated list. Following these papers is the usual 'Abstract of Proceedings'; 'Bird Club Notes,' mostly personal in character and including notices of deceased members; and the list of officers and members, the latter numbering 19 Active, 57 Associate, and 33 Corresponding. Sixteen meetings of the Club were held during the year, with an average attendance of 23 members, the largest number at one meeting being 37. Such a record of attendance and general activity denotes a remarkable and well-sustained interest. The officers for 1905 are: President, Spencer Trotter, M. D.; Vice-President, William A. Shryock; Secretary, William B. Evans; Treasurer, Stewardson Brown.— J. A. A.

¹Cassinia. Proceedings of the Delaware Valley Ornithological Club of Philadelphia, 1904. 8vo, pp. 80, 3 pll. and map. Philadelphia, Pa., Feb., 1905. 50 cents.

Proceedings of the Linnæan Society of New York.—Numbers 15–16 of the 'Abstract' of the proceedings of this society¹ have recently appeared, forming a pamphlet of about seventy pages, with two half-tone plates. Besides the usual abstract of the proceedings, lists of members, etc., it contains the following papers: (1) 'Field notes on the Birds and Mammals of the Cook's Inlet Region of Alaska,' by J. D. Figgins; (2) 'Some Notes on the Psychology of Birds,' by C. William Beebe; (3) 'Some apparently undescribed Eggs of North American Birds,' by Louis B. Bishop. Mr. Figgins's notes are based on observations made in 1901, while connected with the American Museum Expedition of that year to the Kenai Peninsula, Alaska, and are mostly additional to those published in the American Museum 'Bulletin' (Vol. XVI, pp. 215–247). Two half-tone plates give views of characteristic scenery of the region. Mr. Beebe's article, based mostly on his observations made at the New York Zoölogical Society's Garden's, and first published in the Seventh Annual Report of the Society, are here revised and extended. Dr. Bishop's relates to the eggs and nesting habits of two forms of *Rallus* (*R. crepitans scottii* and *R. c. waynei*), two subspecies of *Agelaius* (*A. phæniceus floridanus* and *A. p. fortis*), Nelson's and Macgillivray's Sparrows (*Ammodramus nelsoni* and *A. maritimus macgillivrayi*), Marian's Marsh Wren (*Telmato-dytes palustris marianæ*), and Alma's Thrush (*Hylocichla alma*).

According to the Secretary's report, the Society held six meetings in 1902–03, with an average attendance of 19, and nine meetings in 1903–04, with an attendance "somewhat above the average for recent years." The officers for the year 1904 were: President, Jonathan Dwight, Jr.; Vice-President, Walter W. Granger; Secretary, Clinton C. Abbott; Treasurer, Lewis B. Woodruff.—J. A. A.

Dutcher's Report on Bird Protection.²—Mr. Dutcher's 'Report' opens with a 'History of the Audubon Movement' (pp. 45–58), which had its inception in 1884, through the appointment of a Committee on bird protection at the Second Congress of the American Ornithologists' Union, this leading up to the formation of the first Audubon Society, in 1886, by the management of the Journal 'Forest and Stream,' as an auxiliary to "the Committee of the American Ornithologists' Union." The "second cycle of bird protection" began in January, 1896, with the organization

¹ Abstract of the Proceedings of the Linnæan Society of New York, for the year ending March 10, 1903, and for the year ending March 8, 1904. Nos. 15–16. Published Dec. 19, 1904. 8vo. pp. 1–69, and 2 half-tone plates.

² Report of the National Association of Audubon Societies: also on the Results of Special Protection to Water Birds obtained through the Thayer Fund for the year 1904: together with a History of the Audubon Movement. By William Dutcher, Chairman. Bird-Lore, Feb., 1905, pp. 45–120, 9 half-tone illustrations and 2 maps. Also separate.

of the Massachusetts Audubon Society, followed rapidly by the formation of other State societies to the number of 36, and, finally, the organization and incorporation of the National Association of Audubon Societies, in January, 1905.

The 'Report of the National Committee' (pp. 58-74) opens with several pages of 'suggestions,' relating to (1) legislation for bird protection, (2) the incorporation of State societies, (3) the enlistment of 'Junior' members, the girls and boys, (4) increase of membership, and (5) a 'law Committee' for each society. Then follows a report on the Thayer Fund, which in 1904 amounted to \$3,731, and was expended mainly for the services of wardens, and for printing and distributing 'warning notices' and bird protection literature. An interesting feature is the account of the Committee's work in securing bird protection in the foreign possessions of the United States and in foreign countries, and especially of the prompt aid always rendered by our National Government in such matters. The State Reports (pp. 74-116) are of the usual fulness and abound in information of ornithological interest as well as from the viewpoint of bird protection.—J. A. A.

Hagmann's Concordance of Brazilian Birds described by Spix, Wied, Burmeister, and Pelzeln.—In a paper¹ of 21 pages Dr. Hagmann (including an introduction of four pages by Dr. Gœldi) gives a concordance of the nomenclature of the Brazilian birds described by Spix, Wied, Burmeister, and Pelzeln with that of the Catalogue of Birds of the British Museum, publishing in tabular form the names employed by these authors and the equivalent names of the British Museum Catalogue. Of Spix's 325 species, the generic and specific names both remain unchanged in only 17 cases, while 134 of the specific names remain unchanged. Apparently about the same proportions holds with Wied, but it is very different with the later authors, as would naturally be expected, about one fourth of Burmeister's names, both generic and specific, and about one half of Pelzeln's agreeing with those of the British Museum Catalogue, while about four-fifths of Pelzeln's specific names remain unchanged. This concordance, while not of high utility, is a convenience and in addition furnishes a ready means of getting at much curious information in tracing changes in both taxonomy and nomenclature between the earlier and the more recent standards.

In this connection attention may be called to an important paper by

¹ As Aves Brasilicas mencionadas e descritas nas obras de Spix (1825), de Wied (1830-1833), Burmeister (1854) e Pelzeln (1874) na sua nomenclatura scientifica actual. Chave synonymica organizado pelo Dr. G. Hagmann. Boletim do Museu Gœldi (Museu Paraense) de Hist. Nat. e Ethnogr., IV, 1904, pp. 198-208.

Count von Berlepsch and Dr. Hellmayr¹ relating in part to the same subject. These authors give the results of the examination of the types of many South American birds described by Reinhardt, Tschudi, Cabanis, and Pelzeln. Pelzeln's species here treated, ten in number, are nearly all left undetermined in Hagmann's 'Concordance,' but are here definitely assigned.—J. A. A.

Shufeldt on the Families and Higher Groups of Birds. — In a recent paper of 25 pages, published in the 'American Naturalist,'² Dr. Shufeldt presents his views respecting the arrangement of the higher groups of birds, from families to orders. His scheme of expressing the affinities of the groups, from families upward, is by means of five grades, as follows: orders, supersuborders, suborders, superfamilies and families. He does not admit the existence of subclasses among birds, and recognizes only two orders, Saururæ and Ornithuræ, which correspond to the subclasses of most other authors. As everybody knows, the class Aves is morphologically the most homogeneous of the vertebrate classes, and is necessarily so on account of its volant mode of life, which does not admit of the bizarre types of divergence seen among mammals, reptiles, and fishes. The fundamental plan of structure in the avian type is the special modification for aerial life, and this precludes a wide range of morphological variation. For this reason, according to the views of most systematists, the degrees of divergence that constitute orders are not to be measured by the same standards as in other classes of vertebrates, where a terrestrial or aquatic mode of life permits of wide modifications of the class type.

As already said, Dr. Shufeldt's 'orders' correspond to the subclasses of most modern systematists, while his 39 'supersuborders' correspond to orders. He has also 62 'suborders,' 17 'superfamilies,' and 176 'families.' There is nothing very novel in his arrangement of these various groups, although some of his allocations do not seem to be an improvement upon those previously made. If we translate his 'orders' as subclasses, and his 'supersuborders' as orders, his suborders, superfamilies and families have about the usual significance, and serve very well to indicate the relative rank of the groups thus indicated; except that the application of the terms supersuborder and suborder to precisely the same group adds nothing as an expression of its rank; as, for example, supersuborder Aptenodytiformes and suborder Impennes; supersuborder Procellariiformes and suborder Tubinares, and so on in a dozen other parallel cases. In other instances, as under Halcyonformes, where there are six suborders, the term has some significance and use.

¹ Studien über wenig bekannte Typen neotropischer Vogel. Von Hans Graf von Berlepsch und C. E. Hellmayr. Journ. f. Orn., Januar-Heft, 1905, pp. 1-33.

² An Arrangement of the Families and Higher Groups of Birds. By R. W. Shufeldt. Amer. Nat., Vol. XXXVIII, Nov.-Dec., 1904, pp. 833-857, figs. 1-6.

A number of families more or less currently recognized are suppressed, and we are left in doubt as to the author's allocation of them; in other cases families that actually inosculate, are widely separated. Of course no lineal arrangement can be made to express the affinities of groups that have multiple alliances. On the whole the arrangement here presented appears to be about as satisfactory as any we have seen, it differing not very widely from several of the later systems.—J. A. A.

Clark on New Birds from St. Vincent, W. I. — In working up the birds collected by himself on the island of St. Vincent during 1903–04 Mr. Clark has found four new forms that he considers as entitled to recognition. These are *Euphonia flavifrons viscivora*,¹ inhabiting Grenada, St. Lucia, and Martinique, as well as St. Vincent; *Holoquiscalus dispar*,² *Buteo antillarum*, allied to *Buteo platypterus*, but smaller and more rufous; and *Urubitinga anthracina cancrivora*. We await with interest the publication of his report on the results of his extended ornithological explorations in the Lesser Antilles.—J. A. A.

Mearns on New Philippine Birds. — This preliminary paper on Dr. Mearns's ornithological work in the Philippine Islands during the years 1903–04 contains descriptions of eight new species,³ with notes on seven others new to the islands. The name *Carpophaga* for a genus of Fruit Pigeons is shown to be preoccupied and is replaced by *Muscadivora*, nom. nov. Dr. Mearns, aided by other members of the Philippine Scientific Association, collected over 1000 birds in the military department of Mindinao during 1903 and 1904, comprising 216 species. The more extended paper that may be expected to appear later on this collection cannot fail to increase greatly our knowledge of the birds of this particular district.—J. A. A.

Shelley's 'Birds of Africa,' Vol. IV, Pt. I. — The first part of Volume IV of Shelley's 'Birds of Africa,'⁴ just to hand, includes the first two sub-

¹ Description of a New *Euphonia* from the Southern West Indies. By Austin H. Clark. Proc. Biol. Soc. Washington, Vol. XVIII, pp. 19–22, Feb. 2, 1905.

² Preliminary Descriptions of Three New Birds from St. Vincent, West Indies. By Austin H. Clark. *Ibid.*, pp. 61–64, Feb. 21, 1905.

³ Descriptions of Eight New Philippine Birds, with Notes on other Species new to the Islands. By Edgar A. Mearns, Major and Surgeon, U. S. Army. Proc. Biol. Soc. Washington, Vol. XVIII, pp. 83–90, Feb. 21, 1905.

⁴ The | Birds of Africa, | comprising all the species which occur | in the | Ethiopian Region. | By | G. E. Shelley, F. Z. S., F. R. G. S., &c. | (late Grenadier Guards), | author of "A Handbook to the Birds of Egypt," | "A Monograph of the Sun-Birds," etc. | — | Volume IV. | Part I. | — | London : | published for the Author by | R. H. Porter, 7, Princes Street, Cavendish Square, W. | 1905.—Roy, 8vo, pp. viii + 287, pll. col. xxix–xxxv. Price 31s. 6d. net.

families of the Ploceidæ, the Viduinæ and the Estrildinæ, leaving the Ploceinæ for treatment in Part II of the present volume. The species and subspecies embraced in the present part number 167, being Nos. 356 to 522 of the 'Nomenclator Avium Æthiopicarum,' as given in volume I, or about one-fifth of the Ethiopian ornis. The seven colored plates illustrate 14 species, previously unfigured. As in former volumes (see Auk, XVIII, 1901, pp. 122, 123, and XX, 1902, p. 414, for notices), the text consists of keys to the species and higher groups, the synonymy and principal bibliographical references, and description of the external characters, followed by a summary of what is known of its geographical range and life-history of the species.—J. A. A.

NOTES AND NEWS.

EVAN LEWIS died in Pasadena, California, October 23, 1904. He was born in Berks Co., Pa., April 3, 1856, and there acquired his fondness for bird study which clung to him through his subsequent life. In 1881 he removed to Colorado, where he has since resided, in the vicinity of Idaho Springs.

Here he was engaged in mining interests, and his opportunities for observing the birds of that locality were exceptionally good, and most of his spare time was devoted to them. Probably few persons know the birds of a given district better than Evan Lewis did in his chosen field. His fondness for them frequently led him into the higher mountain regions where the White-tailed Ptarmigans make their summer home. He found numerous nests of these interesting birds, and secured a fine series of photographs, showing the female bird on the nest; the eggs and young; as well as many interesting facts relating to their nesting habits. Eggs of this species taken by him, are in the Smithsonian collection, as well as in the private collections of J. P. Norris of Philadelphia and T. H. Jackson of West Chester, Pa.

Evan Lewis was an enthusiastic student of Nature. No climb was too difficult, no hardship too great to deter him from the pursuit of his favorite object, and his death will be felt as a distinct loss to those who knew him or of his work.—T. H. J.

IN THE January-February issue of 'The Condor' (pp. 28-30) appeared a notice, with extended extracts, of a paper entitled 'Nomenclature in Ichthyology.' While it is professedly based on the A. O. U. Code, it contains several radical departures from it and from all other modern codes, some of them almost revolutionary in character. As the new

'Ichthyological Code' is discussed at some length in the issue of 'Science' for March 17, 1905 (pp. 428-433), further notice of it in the present connection is not necessary, as those interested in nomenclatorial matters doubtless have ready access to 'Science.'

WE congratulate the editor and publisher of 'The Warbler, A Magazine of American Ornithology,' Mr. John Lewis Childs, of Floral Park, N. Y., on the greatly improved character of the first number of its 'Second Series' (Vol. I, No. 1, Jan., 1905), as regards both the matter and the illustrations. Each issue, it is promised, "will contain at least two colored plates of rare North American birds' eggs." The first number opens with a colored plate of the eggs of Kirtland's Warbler, with appropriate text, and contains also a colored plate of the eggs of the Olive Warbler, "one of the two or three sets of this species that have thus far been taken." Subscription, \$1.00 per year, single copies 30 cts.

VOLUME I, No. 1, of a new periodical called 'The Apteryx, A New England Quarterly of Natural History,' bears date, January, 1905. It is edited by C. Abbott Davis, and published "by the Roger Williams Park Museum of Providence, R. I." A journal of this character may be a desirable medium of communication for local workers, and may serve a useful function in increasing interest in the study of the local fauna and flora, but the name of the present candidate for honors seems most inaptly chosen, suggesting New Zealand rather than New England, and ornithology rather than the organ of a local museum, devoted to general natural history and only incidentally dealing with birds. The journal is octavo in form, and the first number consists of 28 pages and two half-tone plates. Subscription, \$1.00 per year, 25 cts. per copy.

THE Chief of the Biological Survey, Dr. C. Hart Merriam, in his report for the fiscal year ending June 30, 1904, gives a most interesting summary (Yearbook Depart. Agric. for 1904, pp. 291-305) of the work carried on under his direction, which comprises the four sections, (1) Geographic Distribution, (2) Economic Ornithology, (3) Bird Migration, (4) Game Protection. Field work on geographic distribution was "carried on over wide areas in California, Texas, New Mexico, Colorado, Alaska, and also in several Provinces of Canada and States of Mexico. In California the field operations for the purpose of securing data for a detailed map of the life and crop zones of the State have been continued under the personal direction of the Chief, along the western slope and foothills of the Sierra Nevada, in some of the interior valleys, and among the Coast Ranges south of San Francisco Bay.

"The field parties in charge of Vernon Bailey, chief field naturalist, have practically completed work in western Texas, and are now in New Mexico. In Texas explorations were carried on mainly in the Pan-handle region and the southwestern corner of the State in the vicinity of El

Paso. In New Mexico field work was done in the northern, middle, and southern parts of the Territory. The work in Mexico, under the direction of E. W. Nelson, was continued, and a supplementary study of the distribution of animal and plant life was made on the southern end of the Mexican table-land, on the Isthmus of Tehuantepec, on the coastal lowlands near Tampico, and in the highlands of Chiapas. The biological exploration of the Mackenzie Basin, including Great Slave Lake and part of the Barren Grounds in the neighborhood of Great Bear Lake, was continued from the previous year. E. A. Preble, who has charge of this work, wintered at Fort Simpson on the Mackenzie for the double purpose of studying the conditions during an arctic winter and of being on the ground to resume field work in the early spring long before the opening of communication with the outside world. These investigations, in connection with recent work in Labrador, and the explorations already carried on by the Biological Survey in the Hudson Bay, Athabasca, and Great Slave Lake regions and Alaska, will form a most valuable chain of observations, making it possible for the first time to understand and intelligently discuss the distribution of the numerous boreal types of animals and plants that inhabit Alaska and enter some of the Northern States. Explorations in Alaska have been continued under the direction of Wilfred H. Osgood, among the northern spurs of the Rocky Mountains, about the upper and middle Yukon, and on some of the islands of southeastern Alaska. A report on the work done by Mr. Osgood about the base of Alaska Peninsula in the summer of 1902 is ready for the press, and will appear shortly." ¹

The investigation of the food of our native birds was continued as usual, through both laboratory work and field observations, the investigations of the past year relating in large part to the birds of California, where Professor Beal was engaged for seven months, with a view of determining not only what damage birds do to the fruit crops, but to what extent they tend to check the ravages of noxious insects.

The work on bird migration was continued as usual, migration schedules being received from the regular observers and filed for future use, and also special circulars requesting data on the arrival and departure of the Nighthawk, Catbird, Kingbird, Red-eyed Vireo, and Redstart, with a view to determining more accurately the principal routes of migration.

The section of Game Protection, under Dr. Palmer, is becoming better equipped and organized, and the report of its work holds a prominent place in the report of the division. It covers: "(1) Supervision of the importation of foreign birds and mammals; (2) coöperation in restricting interstate shipments of game contrary to law; (3) protection of game in Alaska, and (4) collection and publication of matter relating to game pro-

¹ Published Nov. 23, 1904, as *North American Fauna*, No. 24, and noticed in 'The Auk' for Jan., 1905, p. 92.

tection." Permits were issued for the importation of 327 consignments, which include "1470 mammals, 205,400 canaries, and 41,630 miscellaneous birds"; besides, about 17,000 parrots were brought in, for which no permit for importation is required.

A NATIONAL organization of Audubon Societies was effected early in January of the present year through the incorporation under the laws of the State of New York of 'The National Association of Audubon Societies for the Protection of Wild Birds and Animals,' with headquarters in New York City. The particular objects of the Association are: "(a) To hold meetings, lectures and exhibitions in the interest of the protection of birds and animals, and to use all lawful means for the protection of birds and animals. (b) To publish and distribute documents or other printed matter on these or other subjects, and to acquire and maintain a library. (c) To coöperate with the national and state governments and regularly organized natural history societies in disseminating knowledge relative to birds and animals." The membership consists of two classes, Active Members and Sustaining Members; the latter pay an annual fee of five dollars, have the right to vote on all business matters, including the election of the officers and the Board of Directors, and are unlimited as to numbers; the former are chosen by duly organized State Audubon Societies, which are each entitled to name three Active Members, and the American Ornithologists' Union a like number, while seven members at large may be appointed by the Board of Directors. The Board of Directors is not to exceed thirty in number, of whom twenty are to be chosen by the various State Audubon Societies and three by the A. O. U., and seven at large, the full term of office of whom is five years, but to be divided by lot at the first annual meeting into five equal classes, to hold office respectively for one, two, three, four, and five years. The regular meeting of the Board must be held in New York City on the last Tuesday of October; but special meetings may be called as required. The officers are a president, two vice-presidents, a secretary, and a treasurer, and are to be chosen by the directors. At the first meeting of the Board of Directors, held in January, 1905, the following officers were elected for the ensuing year: President, William Dutcher; First Vice-President, John E. Thayer; Second Vice-President, Theodor S. Palmer; Secretary, T. Gilbert Pearson; Treasurer, Frank M. Chapman. An Executive Committee and a Finance Committee, each of five members, including the President and Treasurer as members *ex officio*, were also chosen.

The most urgent need of the Association to enable it to successfully carry on its work is *funds*; and provision has been made that: "\$100 paid at one time will constitute a person a Life Member; \$1,000 paid at one time will constitute a person a Patron; \$5,000 paid at one time will constitute a person a Founder; \$25,000 paid at one time will constitute a person a Benefactor." It is hoped that many philanthropic people, interested in the work of the Association, will early take the opportunity to aid liberally so worthy a cause.

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(Continued on 2nd page of paper.)

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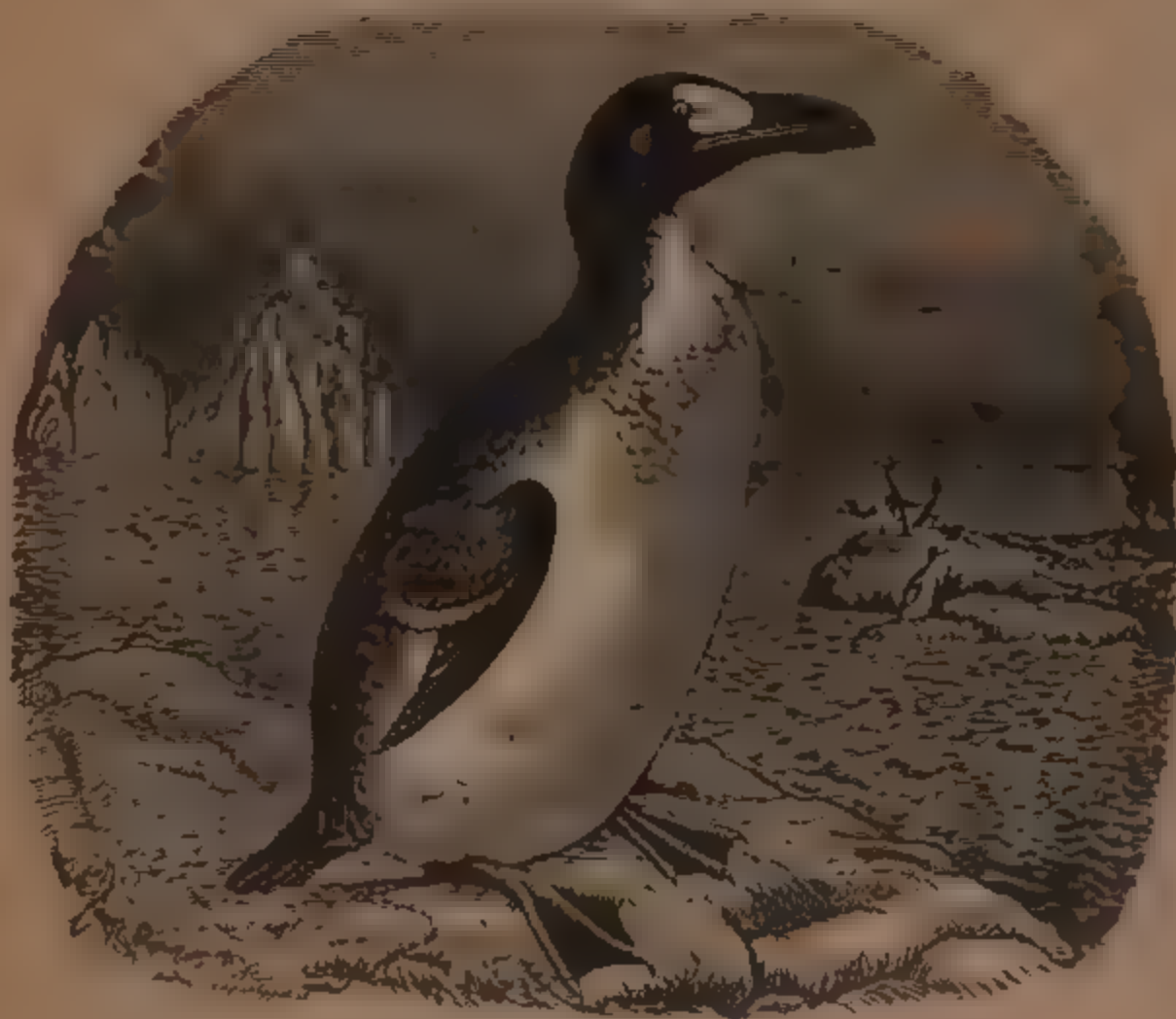
New
Series,
Vol. XXII

The Auk

A Quarterly Journal of Ornithology

Vol. XXII — JULY, 1905 —

No. 3



PUBLISHED BY

The American Ornithologists' Union

CAMBRIDGE, MASS.

Entered as second-class mail matter in the Post Office at Boston, Mass.

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"THE M.K." published quarterly as the Organ of the AMERICAN ORIENTALISTS' UNION is edited by Dr. J. A. ARLEN with the assistance of Mr. FRANK M. JOHNSON.

TERMS: \$4.00 a year including postage, strictly in advance. Single numbers 75 cents. Free to Honorary Fellows and to Fellows, Members, and Associates of the A.O.U. for the year for dues.

Subscriptions should be addressed to DR. RONAPHAN DWIGHT, Jr.,
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THE AUK:

A QUARTERLY JOURNAL OF

ORNITHOLOGY.

VOL. XXII.

JULY, 1905.

No. 3.

ORNITHOLOGICAL RESULTS OF THE CANADIAN 'NEPTUNE' EXPEDITION TO HUDSON BAY AND NORTHWARD. 1903-1904.

BY REV. C. W. G. EIFRIG.

IN the summer of 1903 an expedition was sent out by the Canadian Government to Hudson Bay and northward for the purpose of taking formal possession of certain lands and islands, which for many years had been understood by everyone to belong to Great Britain or Canada, but which in some cases had never been formally claimed as such. The purpose of the expedition was also to establish custom and police relations with some of the whaling stations in the far north, make surveys, etc. The good sealing steamer 'Neptune,' chartered by the government, carried, beside its complement of men and officers, Mr. A. P. Low, in charge of the expedition, several members of the Geological Survey of Canada, Mr. A. Halkett, the naturalist, and an officer and five men of the Northwestern Mounted Police. They left Halifax harbor August 23, 1903, and entered it again October 11, 1904, being thus absent one year and fifty-one days. As such expeditions are not made very frequently and not many ornithologists reach the places visited by this one, it may not be amiss to make the ornithological results obtained more widely known than can be done by the usual government report. The writer, therefore, with the kind permission and aid of Messrs. A. P. Low and A. Halkett, carefully went over the material brought back and took copious notes of it and from the journals of these gentlemen:

The route followed was roughly as follows: From Halifax along the coast of Labrador to Port Burwell, near Cape Chidley, the northeasternmost point of Labrador; from there, with many deviations right and left to some whaling stations, across the northern part of Ungava Bay and westward to Charles Island and Cape Wolstenholme into Evans Strait; south of Southampton Island to Cape Fullerton, at the entrance of Chesterfield Inlet in the northwestern corner of Hudson Bay. Here they remained in winter quarters from October, 1903, to July 18, 1904, at which date the ice broke up sufficiently to admit of their passage out. During this long stay excursions were made inland to the west, northward to Hayes River, and many to Southampton Island. They then sailed out of Hudson Bay over approximately the same route as inward, then from Cape Chidley north to Frobisher Bay, Cumberland Sound, then across Davis Strait to Greenland, and along its coast to latitude $78^{\circ} 40'$. They landed at Ellsmere Land and North Devon Island and went quite a distance west into Lancaster Sound, and into Pond's Inlet, along the coast of Baffin Land; then again eastward on account of the ice, once more into Cumberland Sound, Port Burwell, Kikkerton, Blacklead, etc., and back to Halifax.

The following is a list of the ornithological material brought back and some of the notes furnished me by Messrs. A. P. Low and A. Halkett.

1. *Gavia arctica*. BLACK-THROATED LOON.—Four skins, one male, June 17, 1904, and two females, July 16, 1904, at Cape Fullerton, and one from Southampton Island. One full set of 2 eggs, Southampton Island, July 5, 1904. The eggs are dark chocolate, glossy, with a few and small umber spots; size 3.10×2 in., and 3.10×2.03 in. Common in the northern part of Hudson Bay, but not seen much elsewhere; not seen in winter. Breeds abundantly on Southampton Island in the manner of the common Loon. Stomach contents: stones and fragments of shells, but no fish bones.

2. *Gavia lumme*. RED-THROATED LOON.—Three skins from Cape Fullerton, a male June 17, and 2 females July 16, 1904. One egg, from Cape Chidley, is elongated, dark olive with numerous inconspicuous umber spots or dots. The full set is also two eggs. Size 2.85×1.70 . This species is not quite as common as the preceding, still it is not uncommon in the same places. In Labrador it nests on grass tussocks along the ponds or on little islands in them. It can fly directly from the water (A. P. L.), which the preceding species cannot do so easily. Stomach contents: fish bones and stones.

3. *Cepphus mandtii*. MANDT'S GUILLEMOT.—Eight skins, 6 in adult summer plumage, 2 immature, taken June 16, July 16 and 17, 1904, at Cape Fullerton, where they are common summer and winter, as also throughout Hudson Bay and northward; some were seen at North Devon. Although feeding on crustaceans and small fishes they are used as food by both Eskimos and white people. They nest in cavities under rocks and boulders, one, two, or very seldom three eggs being the full set. They nest late, none of the 12 eggs collected being taken before July 10. The ground color of the eggs is greenish white to chalky white, with large and small spots and blotches of black, umber and lilac, most numerous and largest at the larger end.

4. *Uria lomvia*. BRÜNNICH'S MURRE.—Three skins from Cape Wolsstenholme, Hudson Strait, where there is a large rookery. Male and two females, July 21, 1904. They were sitting on the ice cakes of a large ice jam. All through Hudson Strait they were numerous, often flying about the ship. They are common at North Devon and other arctic islands, also on the coast of Greenland.

5. *Alle alle*. DOVEKIE.—This species was observed to be common from Frobisher Bay northward, where it nests in the cliffs on the coast of Baffin Land, Hall Island, and North Greenland. Two eggs were collected on the Cary Islands near Cape Parry, North Greenland. It deposits its single egg, like the Guillemots, in crevices. The eggs are very pale green, one unmarked, the other sprinkled with minute brown dots.

6. *Stercorarius parasiticus*. PARASITIC JAEGER.—Two skins were brought from Cape Fullerton, where the birds were not uncommon. The Arctic Tern (*Sterna paradisæa*) suffers most from its depredations. Two eggs were collected in Southampton Island; the ground color is dull olive-grayish with dark and pale umber-vinaceous spots and blotches, also some lines. Size, 2.40×1.90 . The stomach contents of this and the next species were bones and feathers, which seems to indicate that they may occasionally act as true birds of prey. This species was more common than the next.

7. *Stercorarius longicaudus*. LONG-TAILED JAEGER.—Three specimens, in the light phase of plumage, were collected at Fullerton (date?). To this species probably belong two Jaeger eggs obtained at Cape Chidley on the outward trip, September, 1903, from Eskimos. They are of the same color and appearance as the preceding, but the markings are more obscure, and they are smaller, measuring 1.80×1.30 and 1.70×1.45 .

8. *Pagophila alba*. IVORY GULL.—A beautiful young bird was taken at Fullerton, Sept. 22, 1904. The primaries are all tipped with black and there are many partly hidden black spots on the greater and lesser wing-coverts, and above the under edge of the wing, which form a pleasing contrast to the otherwise immaculate white, soft plumage. The gizzard contained oily and hairy substances, also what was apparently an onion, gotten no doubt from refuse thrown from some whaler, which they like to follow up.

9. *Rissa tridactyla*. KITTIWAKE. — Met with, but not common.

10. *Larus glaucus*. GLAUCOUS GULL; BURGOMASTER. — An immature specimen was taken Sept. 11, 1904, in Ungava, Labrador. It is in the typical plumage of birds of the year. It had fish bones and surface amphipods in its stomach. Not common.

11. *Larus marinus*. GREAT BLACK-BACKED GULL. — Found to be not rare on the Labrador coast, and common at North Devon. They live on fish, but on account of their size are not subject to the attacks of Jægers. Ten eggs from different nests were collected; ground color, grayish white, greenish or even brown, while the spots and blotches are umber, yellowish brown and pale lilac. Size of three: 3×2.05 ; 3.10×2.15 ; 2.85×2 .

12. *Larus argentatus*. HERRING GULL. — Three adult specimens were taken at Cape Fullerton May 29 and June 10 and 15. They had broken shells, seeds, berries, and one a crab, in the stomach. Common in Hudson Bay and Strait but not common further north.

13. *Xema sabinii*. SABINE'S GULL. — This gull was common on Southampton and other islands, breeding there along the shores and the banks of small ponds in company with the Arctic Tern. They make no nest but deposit their eggs in the sand. Two eggs were taken at Southampton, June 28, 1904; ground color of one, dull pale greenish, the other, grayish greenish white, with brown and pale lilac spots and much blotching of brown and blackish at the large end. These birds were very inquisitive and not at all shy at Southampton.

14. *Sterna hirundo*. COMMON TERN. — Seen in some parts only of Hudson Bay. Not as plentiful as next species.

15. *Sterna paradisæa*. ARCTIC TERN. — One female was taken June 16, 1904, at Fullerton and two more on Southampton Island. This was the most common tern seen from the northern parts of Hudson Bay to the far north. They nest along the shores, placing their eggs, without nesting material, on the sand or gravel. Thirty-six eggs were brought along, which unfortunately were not kept in their original sets, since the Esquimos which lived about the ship would bring some. The ground color varies much, from light grayish brown, olive or pale greenish to darker shades of the same colors. Some have small, others large spots and blotches of umber, pale lilac, etc. Sizes of five: 1.45×1.10 ; 1.65×1.20 ; 1.55×1.10 ; 1.60×1.20 ; 1.75×1.15 . Several were collected at Fullerton, June 28, 1904, others at Cape Chidley, Labrador, in June, 1903.

16. *Fulmarus glacialis*. FULMAR; 'NODDY.' — One taken Aug. 19, 1904, at Eclipse Bay, Pond's Inlet, in the far north. Numbers of them could be seen around the sterns of whaling vessels.

17. *Harelda hyemalis*. OLD SQUAW. — Three skins taken June 16 (♂ and ♀) and June 22 (♂) at Cape Fullerton. These were very dark, upper parts and breast nearly all black; some rusty brown on back, neck and scapulars. They were very abundant and noisy at Fullerton and Southampton. They nest around ponds; the nests are made of grasses,

lined with feathers. One set of 7 eggs was taken June 30, 1904; color pale bluish olive; measurements, 2.25×1.50 ; 2.15×1.45 ; 2.20×1.45 . Another set of 8 eggs, was taken June 27, 1904, also at Fullerton, which were much paler in color; sizes: 2.05×1.50 ; 2.10×1.45 ; 2.35×1.55 .

18. *Somateria mollissima borealis*. GREENLAND EIDER. — This fine duck was found to be common around Fullerton and in all the region to North Devon. Some remained in the open water all winter and were frequently shot for food. The head of one of these, thrown out by the cook, was by chance put into formalin by Mr. Halkett, and this shows a curious anomaly in color, inasmuch as the areas around the bill are black, which Mr. H. thinks is not caused by the preservative. The skins show the regular coloring. A young one, still in its downy stage, was taken at Cumming Creek, North Devon Island, Aug. 13, 1904. The entire upper parts are fuscous, the under parts light mouse color. This species breeds on rocky islands, placing its nest on sandbars, in grass between rocks, or in any available place near the shore. One set of 9 eggs was taken on Southampton Island, July 17, 1904; color, pale olive to greenish gray; sizes: 2.75×2 ; 3.20×2.10 ; 2.90×1.95 . A single egg was also picked up on the beach of Charles Island, Sept. 3, 1904. Two incomplete sets of 4 eggs each were taken at Fullerton, July 17, 1904.

19. *Somateria spectabilis*. KING EIDER. — Not as common as the preceding. Four skins, taken June 16 and 26 at Fullerton and Southampton. It is much less timid than the preceding species, allowing close approach. It does not remain in winter at Fullerton and breeds in different localities from those of *S. mollissima borealis*. It places its soft, down-lined nest on tussocks of grass along the shores and on islands of inland ponds. It was common on Southampton Island where the other was scarce. A set of 4 eggs was taken at this place, June 28, 1904. Color, pale olive gray; size, 2.50×1.75 . The stomach contents were fragments of mollusks, stones and sand.

20. *Chen hyperborea*. LESSER SNOW GOOSE. — This species, called Wavy by the whalers, is rather common on Southampton Island and Baffin Land. Two males were taken June 4 and 7 respectively. On the former date a flock of twenty-two was seen, the first two of which seemed to be Blue Geese (*Chen caerulescens*). Stomach contents: vegetable matter and stones. They breed mostly on islands along the eastern shores of Hudson Bay, and more abundantly to the northward. Their nests are found in wet ground and are made of grass, moss, etc., with down on top, the whole 6-8 inches high. A set of 7 eggs was taken on Southampton Island June 22, 1904. They are creamy white, much like eggs of the common hen; sizes: 3.25×2.10 ; 3.25×2.05 .

21. *Branta canadensis*. CANADA GOOSE. — Found common at Labrador; not met with further north.

22. *Branta c. hutchinsii*. HUTCHIN'S GOOSE. — A typical specimen was taken June 17, 1904, in the vicinity of Cape Fullerton. Length, 27 in.; wing, 17.50; bill, 1.75. The line of demarcation between the black and white areas on the head is a *straight* slanting line.

23.? *Branta c. minima*. CACKLING GOOSE.—There is a skin in the collection which to all appearances belongs here. It was identified as this form also by Mr. E. White, who is familiar with this subspecies from the Pacific coast. It is much smaller than the preceding; the black area on the head is rounded out below the eyes, not forming a straight line, and the depression at the end of the bill is more pronounced. Length, 24; wing, 15.50; bill, 1.25. Both species were rare at Fullerton and Southampton.

24. *Branta bernicla*. BRANT.—A few breed around Cape Fullerton. Not common.

25. *Olor columbianus*. WHISTLING SWAN.—Two were taken on Southampton Island, where it was common, as also in the flat land north of Repulse Bay. They breed in low lands with lakes, where their nests, constructed of seaweed, grass and moss, are very conspicuous. They are very bulky affairs, about 3 feet in diameter at the base tapering to 18 inches at the top, and 18 inches high. A set of 2 eggs was taken on Southampton, July 4, 1904. They are ivory color, unspotted, one end as large as the other; sizes: 4×2.55 ; 3.50×2.45 . It may be interesting to ornithologists who make their own bird skins to hear, that the fat of all these fatty skins was removed by the Eskimos, who *bite* it off. And they do it cleanly and thoroughly. Tastes differ!

26. *Grus canadensis*. LITTLE BROWN CRANE.—A bird of the year was taken in Southampton in July, 1904. No more were seen.

27. *Crymophilus fulicarius*. RED PHALAROPE.—This was very common around Fullerton and Southampton. The skins of five adult and two immature specimens were brought back, taken at the above place in June and July, 1904. They nest around fresh water ponds, laying their eggs, without nesting material, in depressions in the sand or moss, often in lichens. A set of 4 eggs was collected July 2, 1904, at Southampton. They are very acutely tapering; ground color light brown, with large chocolate blotchings. A single egg, taken June 26, had a greenish tint in the ground color.

28. *Actodromas fuscicollis*. WHITE-RUMPED SANDPIPER.—Three adults of this species were taken at Cape Fullerton May 22 and June 16, 1904. Not very common.

Nine sets of sandpiper eggs were brought back, but the owners of most of these were not identified. While it might be possible to identify them by comparing them with sets of known identity and with descriptions and measurements, it would not be satisfactory owing to the great variability in the eggs of the different species, and the little knowledge we have of them in some cases. The first one of these sets was collected June 23 and the last July 4.

29. *Actodromas minutilla*. LEAST SANDPIPER.—This and the Semipalmated were the most common sandpipers in the region. A set of eggs was taken July 4 at Fullerton. The four eggs are, like all these sandpiper eggs, pyriform; the ground color of two is whitish, of the other

two pale brown, with many dark brown, umber, black, and pale lilac markings.

30. *Pelidna alpina sakhalina*. RED-BACKED SANDPIPER.—One adult was taken in July, 1904, at Southampton. Not common.

31. *Ereunetes pusillus*. SEMIPALMATED SANDPIPER.—Very common, as are also their nests. A set of 2 eggs, which Mr. Low thinks is referable to this species, has the ground color whitish, with an almost imperceptible bluish tinge, heavily dotted, blotched and washed with umber, brown, and faint lilac. Spots larger at the larger end; size: $1.25 \times .85$.

32. *Calidris arenaria*. SANDERLING.—Common; one taken at Fullerton June 16, 1904.

33.? *Numenius hudsonicus*. HUDSONIAN CURLEW.—Mr. Low says Curlew are not uncommon on Southampton and breed there. I suppose that would mean this species. None were taken.

34. *Squatarola squatarola*. BLACK-BELLIED PLOVER.—A female was taken at Fullerton in June, 1904. They were not common.

35. *Charadrius dominicus*. GOLDEN PLOVER.—Not rare; some breed on Whale Point.

36. *Ægialitis semipalmata*. SEMIPALMATED PLOVER; RINGNECK.—Common. Their eggs are laid on the sand or gravel of the beaches, no attempt being made at nest building. One set of 4 eggs was taken at Whale Point, near Fullerton, July 1. They are large for the bird, light brown with a slight green tinge and numerous roundish blackish umber and lilac spots and dots. Another set of 3 eggs was taken at Fullerton, June 28.

37. *Arenaria interpres*. TURNSTONE.—Two adults in fine plumage were taken in July, 1904, at Southampton. Rather scarce.

38. *Lagopus rupestris*. ROCK PTARMIGAN.—Fairly common as far north as the willow, dwarfed at last to a height of only six inches, is met with. They build their nest of grasses, etc., lined with finer grass and some of their own feathers. The usual complement is 8–10 eggs. Five eggs of this species were taken at Cape Chidley, Labrador. They were creamy-buff, heavily dotted, spotted, and blotched with blackish umber; size of 2: 1.55×1.15 ; of 3: 1.70×1.20 .

39. *Archibuteo lagopus sancti-johannis*. AMERICAN ROUGH-LEGGED HAWK.—Common at Labrador, where it nests on the *top* of cliffs, not on the side, like the Duck Hawk. The nest is rudely built of sticks. Ten eggs were obtained from Eskimos at Cape Chidley.

40. *Falco islandus*. WHITE GYRFALCON.

41. *Falco rusticolus obsoletus*. BLACK GYRFALCON.—These two species are reported by Mr. Low as common near Cape Chidley and over the whole of Ungava, where they also breed in numbers. Mr. Low has frequently been in Labrador.

42. *Falco peregrinus anatum*. DUCK HAWK.—An immature bird was taken at Fullerton, June 27, 1904. At Cape Chidley and in Labrador generally it is more common, nesting on the *sides* of cliffs, in almost

inaccessible places. Two eggs were obtained at Cape Chidley. They are bright reddish brown, covered so profusely with markings of the same color, only darker, as to almost hide the ground color. Size, 2.10×1.55 :

43. *Nyctea nyctea*. SNOWY OWL.—This species is said by the Eskimos, who are quite shrewd observers, to breed inland from Cape Fullerton.

44. *Otocoris alpestris*. SHORE LARK.—Three male specimens were taken at Fullerton May 25 and 26, 1904. They were not common there; a few could be seen walking around among the Snowbirds. Much more common at Cape Chidley, from where a nest with four eggs was brought. The nest, placed on the ground, partly sunk in moss, is made of moss, plant stems, grasses, finer toward the cup; this is lined with feathers and caribou hair. The outside diameter is 5 in., of cup, 2 in., depth of cup, 1.75–2 in., outside depth, 2–2.50 in. The eggs are of a dull olive whitish ground color, almost covered by innumerable small spots of brownish lilac.

45. *Corvus corax principalis*. NORTHERN RAVEN.—A fine specimen was shot at Eric Cove, Ungava, Sept. 13, 1903. Several were seen at Cape Fullerton throughout the winter. Five were seen flying in single file at Port Burwell. No doubt they are conspicuous in that endless waste of white in winter.

46. *Acanthis linaria*. REDPOLL.—One was taken April 26, 1904, at Fullerton, where it was rarely seen. This is not to be wondered at, when we hear that the largest thing in the line of trees or bushes to be found there are stunted willows, six inches high.

47. *Acanthis linaria rostrata*. GREATER REDPOLL.—A specimen of what seems to be this species was taken on the vessel off the Labrador coast, Sept. 4, 1903.

48. *Passerina nivalis*. SNOWFLAKE.—This was the most abundant bird in all places visited by the expedition, it equalling in numbers all the other birds combined. It was found breeding at all places touched, as far north as $78^{\circ} 30'$. Therefore there was more material brought back of this species than of any other, namely 17 skins and 18 sets of eggs, 7 of which are in their original nests. According to Mr. Halkett the first ones arrived at Fullerton in the season of 1904 about April 7, fresh flocks coming every day after that until after April 20, when they seemed to be all there that cared to stay. About the middle of September they commenced leaving Cape Fullerton and after the 26th of that month no more were seen by him. The skins are of birds taken from April 23 to June 11. Accordingly there is a great variation in the coloring, from the rusty looking individuals which we see further south to the pure white and black of the highest breeding plumage. A female taken May 25 has the feathers of the head black at the base, brownish and grayish at the end; back similar but with some feathers bright rusty. A male, May 29, has upper half of wings pure white, a female, June 11, is blackish fuscous all over.

Although they arrived at Fullerton the middle of April, they did not commence to nest until the end of June. The first and incomplete sets were taken June 30, containing 4 eggs; July 1, two of 3 and one of 4 eggs were taken; July 2, one of 6, July 3 one of 7 and one of 3; July 5 one of 3; July 6 one of 4; from Cape Chidley come two of 7 eggs collected by Eskimos in July, 1903; sets of 4, 5, and 6 eggs each have no date. So the full set seems to vary from 3 or 4 to 7 eggs. There is great variation also in the color and markings of the eggs of different sets. One set has the color pale bluish, much washed with light brownish, with a few conspicuous blackish dots; another is faint bluish white with pale lilac markings, heavily dotted with umber, mostly at the larger end, size $.85 \times .65$; another is darker bluish green, with many minute brown and lilac spots and a few large umber dots at the larger end; some are almost white; some again more elongated in shape than others, one set measuring $.85 \times .55$ in.

All the nests found were not placed in the open, as stated in most books, but below rocks and boulders. In a typical nest the material consists of grasses, old feathers and plant pappus, lined with the last and feathers of larger birds. Some have a lining of caribou hair and the outside rim of moss and lichens. The dimensions are: diameter outside, 6.50 in., inside 2.75 in., height 2.25 in., depth of cup, 1.25-1.50 in.

The stomach contents were small seeds, sand, and vegetable matter.

49. *Calcarius lapponicus*. LAPLAND LONGSPUR. — This species began to arrive at Fullerton about May 26, and was thereafter seen in the company of Snowflakes and Shore Larks. Ten skins were brought home, taken from May 26 to June 16, and one taken on board the vessel Sept. 4, 1903. These skins are far prettier than those of birds taken further south during migration, the blacks being deep and velvety, the chestnut collar bright and glowing. They were not as abundant as the Snowflakes, nor were any seen at Fullerton when the ship reached there at the end of September, 1903.

The first eggs are laid about July 1. The nests are placed in grass in the open, especially on the side of banks of fresh water ponds. Two sets of eggs, one of four, the other of six, were collected, both taken July 1. The size is $.80 \times .62$. They are dull olive or brown, with many streaks, marks and washes of darker brown or vinaceous. The nest is of coarser make than that of the Snowflake, the walls are also thinner. It is made of grass, the cup, lined with fine grasses and feathers, is large for the bird. Outside diameter 3.50 in., of cup 2.50 in., depth of cup, 2.50 in.

50. *Setophaga ruticilla*. REDSTART. — A poor skin of one was shown to Mr. Halkett at Port Burwell by the factor of the station, showing that this species occasionally reaches the north of Labrador.

51. *Anthus pensilvanicus*. AMERICAN PIPIT. — Not rare at most places visited. The nest is placed on the ground in grass.

THE FORMS OF *VERMIVORA CELATA* (SAY).

BY HARRY C. OBERHOLSER.

THREE forms of the North American warbler, *Vermivora*¹ (= *Helminthophila*) *celata* (Say), are at present commonly recognized. An examination of the pertinent material in the Biological Survey of the Department of Agriculture and in the United States National Museum, some 280 specimens in all, shows conclusively that an additional race should be defined, and that the ranges, as well as, to slight extent, also the characters of the already known forms readjusted. This is attempted in the succeeding paragraphs.

Vermivora celata celata (Say).

Sylvia celatus SAY, Long's Exped. Rocky Mts., I, 1823, p. 169.

Helminthophaga celata var. *obscura* RIDGWAY, in Baird, Brewer and Ridgway, Hist. North Am. Birds, Land Birds, I, 1874, p. 192, pl. xi, fig. 6 (Georgia and Florida).

Chars. subsp. — Of medium size; palest and most grayish of all the forms of the species.

Type locality. — Engineer Cantonment, Council Bluffs, Iowa.

Geographical distribution. — Alaska, excepting the coast region from Cook Inlet southward; Canadian territories of Yukon, Mackenzie, Athabasca, and central Keewatin; in migration south to Washington. Arizona, Texas, Florida, South Carolina, New England, and eastern Mexico to the state of Hidalgo.

Specimens from the neighborhood of the western base of the Alaska Peninsula are quite typical *celata*, though of rather large size: the only example from Kadiak, an adult male in perfect plumage, taken June 7, 1893, is of maximum *celata* dimensions, and is much too grayish for *lutescens* or even the Rocky Mountain race. This form of the species is, like all the others, noticeably more grayish in fall and winter than in summer. The bird described as *Helminthophaga celata* var. *obscura* by Mr. Ridgway²

¹ For the use of this generic name, cf. Oberholser, Smithson. Quart., III, 1905, p. 66.

² Baird, Brewer, and Ridgway, Hist. North Am. Birds, Land Birds, I, 1874 p. 192, pl. xi, fig. 6.

was based on adventitiously soiled winter individuals of typical *celata*.

True *celata* has been detected from the following localities, breeding records being indicated by an asterisk:

Alaska: — Circle*; Yukon River, 20 miles above Circle*; Mountains near Eagle*; Yukon River at Alaska-Canada Boundary*; Fort Yukon*; St. Michael*; Mouth of Porcupine River*; Nushagak*; Lake Clark*; Port Heiden*; Lake Aleknagik*; Kadiak Island*; Lake Iliamna*.

Alberta: — Edmonton.

Assiniboia: — Medicine Hat; Indian Head.

Athabasca: — Fort Chippewyan*; Smith Landing*.

Keewatin: — York Factory*.

Mackenzie: — Fort Resolution*; Fort Rae*; Fort Simpson*.

Manitoba: — Carberry.

Yukon: — Caribou Crossing, Yukon River*.

Arizona: — Fort Huachuca.

Florida: — Gainesville; Newman's Lake, Alachua County; Fort Basinger; Enterprise.

Georgia: — Atlanta.

Illinois: — Mt. Carmel.

Montana: — Fort Keogh.

North Dakota: — Souris River.

South Carolina: — Mount Pleasant; Port Royal.

Texas: — Fort Clark; San Antonio; Laredo; Sycamore Creek.

Washington: — Neah Bay.

Wisconsin: — Dane County.

Hidalgo: — Pachuca.

Nuevo Leon: — Monterey.

Tamaulipas: — Camargo; Matamoras; Soto la Marina; Charco Escondido.

***Vermivora celata orestera*, subsp. nov.**

Chars. subsp. — Similar to *Vermivora celata celata*, but larger and much more yellowish, both above and below.

Description. — Type, adult male, No. 186782, U. S. N. M., Biological Survey Collection; Willis, New Mexico, July 16, 1903; V. Bailey. Upper parts yellowish olive green, brighter on the rump and upper tail-coverts, the crown with a partially concealed orange rufous patch; wings and tail fuscous, edged with yellowish olive; sides of head and neck yellowish olive, somewhat lighter than the back; a rather ill-defined yellow superciliary stripe; under surface yellow, washed with olive, most heavily so on breast and sides.

Geographical distribution.—Mountains of New Mexico, Arizona, and southeastern California, to British Columbia; in migration east to Minnesota and Pennsylvania, south to Texas, and Mexico to Lower California, Michoacan, Guerrero, and Puebla.

This new form has usually been included with *V. celata celata*, but breeding specimens recently obtained, principally from New Mexico and British Columbia, indicate its much closer relationship, in all respects except size, with the west coast forms. From *Vermivora celata lutescens* it may, however, readily be distinguished by its duller, less yellowish color, both above and below, and by its much greater size.

Specimens of this form are in hand from the subjoined localities:

Alberta :— Canmore; Banff; Edmonton.

British Columbia :— Penticton.*

Arizona :— Mount Graham*; San Francisco Mt.; San Pedro River, Mexican Boundary Line; Adonde; Tucson; Fort Huachuca; seven miles north of Bisbee.

California :— Argus Range; Panamint Mts.*; Olanche Peak.

Colorado :— Denver.

Minnesota :— Fort Snelling.

Montana :— Columbia Falls; Fort Keogh; Dry Creek, Gallatin County; Jefferson River, Gallatin County.

Nevada :— Ruby Mts.*; Humboldt Valley; Upper Humboldt Valley.

New Mexico :— Willis*; Rinconada; Stinking Spring Lake; Guadalupe Cañon, Mexican Boundary Line; Taos Mts.; Fort Defiance; Big Hatchet Mts.; Arroyo Hondo*; Santa Rosa; Culebra Mt.*; Twining*; Capitan Mts.*; Corner Monument No. 40 (100 miles west of El Paso), Mexican Boundary Line.

Pennsylvania :— Williamsport.

Texas :— Guadalupe Mts.; Fort Clark; San Antonio; Benbrook; Paint Rock.

Utah :— Parley's Park, Wasatch Mts.*

Wyoming :— Fort Bridger*; Bridgers Pass.

Chihuahua :— Chihuahua.

Guanajuato :— Guanajuato.

Guerrero :— Mountains near Chilpancingo.

Hidalgo :— El Chico.

Jalisco :— San Sebastian.

Lower California :— La Paz; Gardiners Lagoon, Salton River.

Michoacan :— Patamban.

Morelos :— Huitzilac; Tetela del Volcan.

Nuevo Leon :— Rodriguez; Monterey.

Puebla:—Orizaba ; Huachinango.

San Luis Potosi:—Soledad ; San Luis Potosi.

Tamaulipas :—Matamoras.

***Vermivora celata sordida* (Townsend).**

Helminthophila celata sordida TOWNSEND, Proc. U. S. Nat. Mus., XIII, 1890, p. 139.

Chars. subsp.—Similar to *Vermivora celata orestera*, but wing shorter ; bill longer ; upper and lower parts darker and duller.

Type locality.—San Clemente Island, California.

Geographical distribution.—Santa Barbara Islands, California ; occasional on adjacent mainland.

Specimens have been examined from the following localities :

California:—Santa Catalina Island ; Santa Cruz Island ; Santa Rosa Island ; San Clemente Island ; Pasadena.

***Vermivora celata lutescens* (Ridgway).**

Helminthophaga celata var. *lutescens* RIDGWAY, Amer. Journ. Sci. and Arts, 3rd Ser., IV, Dec. 1872, p. 457.

Chars. subsp.—Similar to *Vermivora celata sordida*, but smaller, and lighter colored, the yellow of lower parts brighter, the olive green of upper surface more yellowish.

Type locality.—Fort Kenai, Alaska.

Geographical distribution.—Pacific coast region, from Cook Inlet, Alaska, to Los Angeles County, California, east to the Sierra Nevada and Cascade Mountains ; in winter east to Nevada and Arizona, and south through western Mexico to Guatemala.

Birds from the northern Sierra Nevada (Lake Tahoe to Mount Lassen) are somewhat intermediate between *V. c. lutescens* and *V. c. orestera*, but appear to be nearer the former. In the original description of this race¹ the range is said to be "Pacific coast from Kadiak to Cape St. Lucas," and Mr. Ridgway has recently given² the type locality as Kadiak Island ; but the Kadiak bird is, as already noted, almost typical *celata* ; while the type locality is really Fort Kenai, Alaska, as proved by the type specimen, an

¹ Am. Journ. Sci. and Arts, 3rd. Ser., IV, Dec. 1872, p. 457.

² Birds N. and Mid. Amer., II, 1902, p. 467.

adult male collected by Bischoff, which still bears its original label with the statement that it is the type.

Examples of this race have been seen from the localities given below :

Alaska :—Kasaan Bay, Prince of Wales Island* ; Sitka* ; Yakutat* ; Haines* ; Fort Kenai* ; Gustavus Point* ; Mitkof Island* ; Wrangell* ; Virgin Bay* ; Glacier Bay.*

Arizona :—Fort Huachuca ; Tinajas Altas, Mexican Boundary Line ; Pinal County.

British Columbia :—Port Simpson* ; Cumshewa Inlet, Queen Charlotte Islands* ; Victoria* ; New Westminster ; Burrard Inlet* ; Wellington* ; Port Moody* ; Lund, Melaspina Inlet*.

California :—San Francisco* ; Rio Dell* ; Calaveras County* ; Lassen Peak* ; Donner* ; Mount Shasta* ; Tejon Valley ; Weaverville* ; Riverside ; Mono Lake ; South Fork of Merced River* ; Soda Springs* ; Los Gatos* ; Fort Jones* ; Oakland ; Haywards ; Baird* ; Yuba County.

Nevada :—East Humboldt Mts. ; Humboldt Valley.

Oregon :—Sodaville ; Columbia River ; Fort Klamath ; Diamond Lake* ; Beaverton ; Maury Mts.* ; Fort Umpqua* ; Seaside* ; Portland* ; Des Chutes River.

Washington :—Neah Bay* ; Mt. St. Helens* ; Chiloweyuck Depot* ; Fort Steilacoom ; Lapush* ; Suez*.

Colima :—Manzanillo.

Lower California :—La Paz ; Cape St. Lucas ; Sierra San Gertrude.

Sinaloa :—Mazatlan.

Millimeter measurements of males of the four forms of *Vermivora celata* may be compared from the following table :

Vermivora celata celata.

Locality.	Date.	Wing.	Tail.	Exposed culmen.	Tarsus.	Middle toe.
Circle, Alaska	July 16	59.5	48.5	9.	18.	10.5
Fort Resolution, Mackenzie .	June 22	59.5	47.	10.	16.5	11.
“ “ “ “	“ “	61.5	47.5	9.5	18.5	11.
York Factory, Keewatin . .	July 16	60.	48.	10.	17.5	9.5
Fort Chippewyan, Athabasca	June 1	61.5	50.	9.	17.	10.5
Smith Landing, Athabasca .	June 11	61.	48.5	10.	17.5	10.5
Carberry, Manitoba	May 14	62.5	50.5	9.5	18.	11.
Mt. Carmel, Illinois	Apr. —	63.	49.5	10.	18.	11.
Gainesville, Florida	Feb. 1	64.	53.	11.	18.5	11.5
Fort Clark, Texas	Mar. 22	61.	49.	10.	17.	10.5
Average		61.4	49.2	9.8	17.7	10.7

Vermivora celata orestera.

Locality.	Date.	Wing.	Tail.	Exposed culmen.	Tarsus.	Middle toe.
Willis, New Mexico . . .	July 16	63.	51.	10.5	18.5	11.
" " " . . .	Aug. 19	63.5	51.5	10.	18.	10.
Rinconada, New Mexico . .	Apr. 28	64.	50.5	10.5	17.5	11.
" " " . . .	May 3	66.	53.	10.	18.	10.5
Stinking Spring Lake, N. M.	Oct. 2	61.5	49.5	11.	17.5	10.
Argus Range, Calif. . . .	May 9	62.	48.5	10.	18.5	10.
" " " . . .	"	64.	50.	10.	18.5	10.
Columbia Falls, Mont. . .	May 4	64.	50.	10.	19.	10.5
Ruby Mts., Nevada . . .	June 20	63.5	49.5	10.	19.5	10.5
Guadalupe Mts., Texas . .	Aug. 24	62.	50.	10.	18.	10.5
Average		63.4	50.4	10.2	18.3	10.4

Vermivora celata sordida.

Locality.	Date.	Wing.	Tail.	Exposed culmen.	Tarsus.	Middle toe.
Santa Catalina I., Calif. . .	Apr. 23	60.5	50.	11.5	18.5	11.
" " " . . .	" 11	62.	51.5	10.5	18.5	10.
" " " . . .	" 20	60.	51.5	11.	18.5	11.
" " " . . .	" 12	61.	52.5	11.5	18.5	10.5
" " " . . .	" 21	59.5	48.5	11.	18.5	10.5
" " " . . .	" 25	62.	51.5	12.5	19.	12.
" " " . . .	" 22	62.	52.	11.	18.	10.5
" " " . . .	" 22	60.	47.5	11.	19.	11.
Santa Cruz I., Calif. . . .	Feb. 7	60.5	52.	11.5	19.	11.
Santa Rosa I., Calif. . . .	Jan. 7	59.	49.5	11.	19.	11.
Average		60.7	50.7	11.3	18.7	10.9

Vermivora celata lutescens.

Locality.	Date.	Wing.	Tail.	Exposed culmen.	Tarsus.	Middle toe.
San Francisco, Calif. . . .	May 3	60.5	47.	9.5	18.	11.
Sodaville, Oregon	May 21	57.	44.	9.5	17.5	10.5
Neah Bay, Washington . .	May 18	61.	48.	10.	16.	11.
" " " . . .	June 4	60.	48.	10.	17.5	11.
Fort Simpson, Brit. Col. . .	Aug. 13	61.	47.	9.	18.	11.
Queen Charlotte Is., Brit. Col.	June 15	60.5	49.5	10.5	17.	10.5
Prince of Wales I., Alaska .	May 19	59.5	46.	10.5	18.	10.5
Sitka, Alaska	July 31	58.5	47.5	10.	18.	11.
Yakutat, Alaska	June 19	59.	45.	10.	17.5	10.5
Haines, Alaska	June 1	59.	47.	10.	18.	12.
Average		59.6	46.9	9.9	17.6	10.9

WILLIAM SWAINSON TO JOHN JAMES AUDUBON.

(Hitherto Unpublished Letters.)

BY RUTHVEN DEANE.

THE following letters, covering dates between 1828–30, show, as in other letters of Swainson's which I have published, his crude method of writing and expressing himself. In Dr. Albert Günther's interesting address delivered at the Anniversary Meeting of the Linnæan Society of London, May 24, 1900, he writes: "Swainson was extremely careless in orthography and loose in his style of writing; he persistently misspelt not only technical terms, but also the names of foreign authors, and even of some of his familiar friends and correspondents." These letters were written at a period when he was deeply engaged in his literary pursuits, yet in a discontented and nervous frame of mind, mortified at the slow sale of his 'Zoological Illustrations,' his temporary embarrassment for funds, and his evident growing dislike for American naturalists.

I am under many obligations to Miss M. R. Audubon for the gift of three of these letters and to Miss M. Eliza Audubon for the loan of the others with permission to publish them.

NO. I.

Tuesday 11 Nov. 1828.

I had written the enclosed, my dear Mr. Audubon, before your letter of Monday reached me. It has come this instant. Dreams, you know, must be always interpreted *contrawise*, we might have lifted up our arms, as you saw in your dream but, if you had not awoken, it was no doubt to have shaken hands! But that my regard for you may be evinced, I will bring myself to lay under an obligation, which I would only ask from one of my own family. I was that moment thinking to which I should write, to ask the loan of 80£ for a few months, and now I will ask it of *you*. If you was aware of the peculiar feelings which we Englishmen have

on such occasions, perhaps you would smile, but so it is that we never ask any one, from whom we have the least idea of a refusal. Now, did I not believe you to be a sincere friend, do you imagine I should have told you I was in want of Money much less have asked you to lend me some. The fact is, I have suffered a severe loss during my being in Paris, what little I had *on hand*, has been spent there and in making preparations for the publication of my Zool. Illustrations. Two or three months however, hard work will bring me round again & repay you.

Let me see your letter to the President of Zool. Soc.¹ before it goes, and you shall see mine.

I shall be most thankful for the Grouse. I send 2 drawings to Havell to be engraved *spur him on* for I want to have every thing ready before the new year.

Yours most sincerely
W. Swainson.

John J. Audubon Esq.
79 Newman St.

No. 2.

Friday.

[No date given, probably 1828].

My dear Audubon,

I am rejoiced to hear you are safe and well, & I answer your letter immediately, for I have no prospect of going to London, for some weeks, nor could I expect on a matter of urgent necessity, for I am to have my first volume or "Preliminary Discourse" ready the first week in June under a penalty of 500 £.

As I cannot come to you, pray write me some few of the many things you want to say to me. When once this volume is done I shall have time to breath. You will find I have put your friend V.[igors] *hors de combat*.²

¹ Audubon was elected an original member of the Zoölogical Society of London, February 24, 1828.

² While in Paris in 1828 Swainson entered into a lively controversy with Vigors, and as Dr. Theodore Gill writes "a great fire was kindled from a very little flame." For a detailed account see 'Osprey,' Vol. V, No. 3, and subsequent numbers.

He is now part of O'Connell's¹ Political *tail*. Kind regards to Mrs. A. & your son.

Ever yours, most sincerely
W. Swainson.

J. Audubon Esq.
care of Mr. Havell,
77 Oxford St.
London.

No. 3.

18 January, 1829.

My dear Mr. Audubon,

I write this in utter uncertainty whether it will find you in London. My first number² has now been out three weeks — it has been seen and universally admired, and how many copies do you think the Publisher has sold? now pray guess as the Americans say. 100 — no. 50 — no. twentyfive, no. fifteen, no. ten? yes. positively ten copies and *no more*, has been sold. I blush almost to confess this mortification to even, *you*, but so it is. Now, my dear Sir, what am I to think of the “generally diffused taste” as the phrase is, for Natural History.³

This although vexing to *me*, may be a consolation to *you*, who are able to exhibit on what I call your *Red Book* the names of a

¹ An Irish political patriot. Born 1775, died 1847.

² Zoological Illustrations. 3 vols., 1820–23, with 182 colored plates by himself. Second Series. 3 Vols., 1832–33.

³ In the preface of ‘Zoological Illustrations,’ Second Series, Vol. II, 1831–32. Swainson writes: “Neither literature nor art has been encouraged in our opulent Island, half as much as they have been by some of the petty Kingdoms of the Continent. It is a melancholy fact, that while our present laws crush individual exertion, by extorting a large number of free copies of the most costly works, undertaken by their Authors without the slightest hope of remuneration, the Government of France assigns *for subscriptions* to such publications, an annual sum of £10,000. But on questions regarding the patronage of science, Great Britain, unfortunately, is poorer than any Nation in Europe.” This volume was dedicated to King Louis Philippe, of whom Swainson writes: “A true Patron to Science, munificently encourages, both privately and publicly, all who are engaged in its pursuit.”

good portion of 150 Subscribers to a 200 guinea Book. Think yourself my friend exceedingly well off.

The amount of sale must be kept silent, it would be a nice nut to crack for V[igors]¹. & his friends.

I shall be able to do without the water birds, if you have not found any.

I have had a most extraordinary letter from Waterton,² which will highly amuse you. The man is mad. — stark, staring, mad.

Yours very faith'ly

W. Swainson.

Can you tell me any safe expeditions made of sending and receiving letters and Parcels from Philadelphia.

J. J. Audubon Esq.
79 Newman St.
Oxford St.

No. 4.

Saturday, 1 May, 1830.

Welcome once more, my good friend to merry England:³

I had indeed heard from Havell,⁴ with the greatest pleasure, that you had safely landed at Liverpool; and I regret very much that you did not reach London before I left it; for I am now much seldomer in town than formerly, and I know not when I may have the power to do so again. My old and most valued friend Mr. Burchell⁵ has also, to my great delight, just returned

¹ Nicholas Aylward Vigors. Born 1787, died 1840. Naturalist. First Secretary of the Zoölogical Society of London.

² Charles Waterton. Born 1782, died 1865. For one of his most vindictive letters to Swainson, see his 'Essays on Natural History,' 1871, p. 511. This effusion is bitter from start to finish and contains some four thousand words.

³ Audubon sailed for America April 1, 1829 where he remained one year, returning in April, 1830.

⁴ Robert Havell. Engraver of Audubon's plates. Born November 25, 1793, died November 11, 1878.

⁵ William John Burchell. Explorer and Naturalist, who collected extensively in Brazil, Africa, and other countries. Born 1782, died March 3, 1863.

to England after *six years* spent in wandering over the Forests and Andes of South America bringing with him collections, that will make everything else in this country *sink into utter insignificance*, he too, is longing to see me, and if I possibly can get away for a day next week, with two such desirable objects I will, but my literary engagements bind me, hand and foot.

You think I do not know that you are an F. R. S.¹ — you are mistaken, furthermore, will you be surprised at knowing I have been fighting your battles against a rising opposition which originated among some of your *Ornithological friends* (at least so I strongly suspect) for the purpose of your name being *blackballed*. But more of this when we meet, such matters had better not be committed to paper.

The whole of your bundle of young trees reached me as withered sticks, not a spark of life in any one of them.

So you are going to write a book 'tis a thing of little moment for one who is not known, because they have no reputation to loose, but much will be expected from *you*, and you must, therefore, as the saying is, *put your best leg foremost*. I am coming fast round to the prejudice, as you may think it, against the Americans.

Dr. Richardson's and my own volume on the Arctic Birds,² is now at press. Not being able to refer to your plates, I have not had the power to quote your work, you know how repeatedly I have applied on this head, both to you and Mr. Havell in vain.

Prince C. Bonaparte³ has long promised me his second & third volume but they have never come. Ward⁴ is a regular *Scamp* he has taught me a good lesson — fool that he is — and that is, to steal my heart against distress such as his was, and to consult, like all the rest of the world, my own interest only. I am sick of the world and of mankind, and but for my family would end my days in the primeval forests of my beloved Brazil.

¹ Audubon was elected a Fellow of the Royal Society of England. March 18, 1830.

² Fauna Boreali-Americana. Part 11, 1831.

³ Charles Lucian Bonaparte. Born 1830, died 1857.

⁴ J. F. Ward. Swainson refers to him as an animal preserver of considerable talent.

So Mr. Lea¹ did not settle my account with you? I have found *him out*, also, to be no better than he should be. He also is one of your *friends* who would, if he could, cut your throat. Another *friend* of yours has been in England, Mr. Ord² and has been doing you all the *good* he can: if these are samples of American Naturalists, defend me from ever coming in contact with any of their whole race.

Mrs. Swainson's health I am grieved to say, has suffered much the last twelve months, she is now at Birmingham with the children. I have not failed to mention your kind inquiries after both, whenever Havell has a parcel for me, I hope you will occasionally accompany it with a few lines.

Yours my dear Sir very faith'ly

W. Swainson

John J. Audubon
at Mr. Havell's
79 Newman St.
Oxford St.

No. 5.

My dear Mr. Audubon:

I am still very poorly, but as I can put this under cover, I should wish to ask you, whether you would like to have a copy of my Illustrations,³ with the plain proof on India paper, there are only 10 printed for *private* Sale (to avoid the tax of Public Libraries)⁴ and I have just now one copy of the first volume bound up. Should you like it, you can return me the three numbers of the common edition. I shall then have greater hopes of possessing

¹ Isaac Lee of Philadelphia, Pennsylvania, naturalist and publisher. Born 1792, died December 8, 1886.

² George Ord. Born 1781, died January 23, 1866. I quote from 'Audubon and his Journals,' Vol. 1, p. 56: "Mr. Ord was one of those (of the very few, I might say) who disliked the Naturalist from first to last, who was perhaps, his bitterest enemy."

³ 'Zoölogical Illustrations.'

⁴ They secure the Author the sole right to publish his works for twenty-eight years, upon the presentation of eleven copies to the public libraries of the Kingdom.

myself of your Gigantic book, some day or other ; at present one of my *volumes* only cost as much as one of your *numbers* !

Let me, as a friend, request you not to decide irrevocably on the subject of your book. I have thought upon it much since I saw you, and I want to find time to write you more fully upon it than I was able to speak, on the first consideration of the matter, particularly as I was then nervous and unwell.

I hope in 2 or 3 days to write you this, at present I am much hurried, and am expecting Sir W. Jardine¹ and Mr. Selby² every day.

Yours very Faith'ly

W. Swainson

J. J. Audubon Esq.

43 (Toy shop, corner house)

Great Russell St.

Bloomsburg ?

13 May 1830.

No. 6.

My dear Mr. Audubon.

Your letter perfectly surprised me. I thought you were wandering about Lancashire ! Have you been and returned or are you going. Why are you so sad ? I would lay ten shillings that old Havell has been disappointing you as he has done me. He is in matters of business a complete *daudle* — an old woman, and I have done with him. His son I think better of he has a good idea of punctuality in business. Still he also wants an occasional spur. I have been drawing Richardson's Grouse, but have not succeeded to my mind.

I am terribly hurried in preparing my first number. Pray desire Havell to hand you a copy, & to supply you every month with it. I am preparing a few sets of the old Series, and one will be sent to you, our exchange will then be fairly commenced.

I wrote very particularly to Pitois³ three weeks ago, and am surprised at having no answer. I shall come to town some of these

¹ Sir William Jardine. Born February 23, 1806, died November 21, 1874.

² John Prideaux Selby. English ornithologist. Author of 'British Birds.' Born July 23, 1788, died March 27, 1867.

³ M. Pitois, Paris, France. Acted as Audubon's Agent on the recommendation of Baron Cuvier.

days unexpectedly and surprise you. I cannot however bear that you should be "in the blues" at this season of merriment and festivity. If therefore you think it would give you pleasure, it certainly would to Mrs. Swainson and myself to see you at our Christmas dinner, where there will be only ourselves. The weather is remarkably fine, and the change air and scenes will invigorate & make you for the time forget those every day annoyances which we are all subject to.

If you come, have the goodness to let us know and I shall trouble you to bring with you everything which Havell has for me & which he will pack up in a parcel, your bed is quite ready.

I shall thank you also to buy me a pair of clogg springs, similar to the pattern sent.

In one of your walks I hope you have thought about the *French Wine* that we talked so much about and have ascertained the particulars from your friend, so that we may order a cask. I hope you have not mistaken the price, — for if not, nothing that can be drank in this country is one half as cheap. Mrs. Swainson & the little ones are quite well & all hope to see you soon.

Ever yrs faith'ly
W. Swainson.

J. Audubon Esq.

Monday morn.g.

No. 7.

My dear Mr. Audubon

I welcomed the news of your arrival in America yesterday, and as I am making up a packet for Liverpool today, I seize the opportunity of wishing you joy and happiness in the new world. I am surprised and disappointed as not receiving one line from Ward it is at the best negligent, and somewhat ungrateful. Hope you have began your studies among the birds on a better plan than formerly, that is, in preserving the skins of every one on which there is the least doubt whether the bird is young or old, particularly the former. If you are to give scientific descriptions and definitions of the species this precaution is absolutely necessary. What your Americans do with their money I know not, Mr. Lea tells me he cannot procure one purchaser for my new Illustrations: *here* it now going on very well.

You asked me what you can do for me in America. I will tell you. Send me a cart load of shells from the Ohio, or from any of the *Rivers near New Orleans*. The *very smallest*, as well as the *very largest*—*all sizes*. I have been long expecting those which your son promised you for me near twelve months ago! *but I have heard nothing of them!* you may spend a few dollars for me and send people to fish the shells at the dry season, when the waters are *low*, that is the best time.

Things go on here much as usual, but I have not been in London since Xmas. The first volume, containing the Quadrupeds, of Dr. Richardson's work, is out. I am now busy in preparing the second, which contains the Birds. Let me particularly direct your attention to the manners of the Cedar Bird, *Ampelis Americana*. I suspect it feeds much on Insects in default of fruit, but what is desirable, is to know *the way* in which it captures Insects, whether as a flycatcher ie. by seizing them on the wing, or like the Gold crest—by picking them up among the branches or leaves. I am now in close correspondance with Charles Bonaparte, & a most valuable correspondant he is.

Mrs. Swainson is just recovering from her confinement after giving me another little son I am happy today they are both going on well.

Wilson I believe mentions *two* birds very like the Red eyed Flycatcher, this is a point deserving your attention, but the *manners* of these birds are much more important. I feel convinced there are several species of my Genus *Ammodramus* shore finch, in the So. States, they all have narrow pointed tails, like the seafinch of Wilson. I further suspect there is more than one species confounded with the Towee Bunting.

I hope soon again to hear more fully from you, and of your ornithological acquisitions. The dear little ones are quite well.

Yours very sincerely,

Wm. Swainson

The Green 2^d June 1829.

Mr. John J. Audubon
care of

Mess. Thomas E. Walker & Co.
Merchants.
New York.

No. 8.

My dear Mr. Audubon.

I delayed not replying to your last letter soon after I received it, and it fortunately was sent to Havell the very day that he was making up a packet for you, I conclude therefore it has long ago reached you. I know not in what part of the Wilds of America you may now be wandering, but I hope you are fully intent upon your great object, and that you are not only making drawings, and taking notes, *but preserving Skins.* of all your little favorites. Don't forget the *Shrikes*, of which I have strong suspicions there are 2 or 3 species mixed up with the name of Loggerhead. Should you be in the land of the *Scarlet Ibis*, do pray procure a dozen or two of the best skins, they are the most magnificent birds of No. America, and are said to be common towards New Orleans.

You will learn from the Newspapers how uncommonly severe is our winter the snow has now been upon the ground five weeks and it is still falling. I manage, however to walk out every day, and thus have acquired better health than I have enjoyed for many years.

Previous to your embarking to England, which I hope you will do very early in the spring you must do me one favor. Bring me two Grey Squirrels alive, and a cage full of little birds, either the painted or non-Pareil finch the Blue finch, or the Virginian Nightingale, as they are called, 3 or 4 of each to guard against casualties by death on the voyage. I do not care one farthing whether they sing or not, so that I presume they may be got for a mere trifle. The Squirrels would delight the little people beyond measure, and would prove a neverfailing source of amusement to them. I believe you have other kinds than the *grey*, so that any will do. If you cannot get them pray supply their place by two Parrots of America.

We continue pretty well at the Green.¹ Seldom go to town, but I find people begin to discover the true character of V.[igors] and many that were formerly his friends now speak very differently

¹ Tittenhanger Green. Within a mile of the little village of London Colwey, Herts.

of him. His father having died the property has come to him. He has now taken a fine house in the Regents park, and holds *conversaziones* (in humble imitation of those of the President of the Royal Society) every Sunday evening *during the season*!! all this is very grand, and he appears to have abandoned writing any more papers on ornithology, since I have began to point out his errors.

Ward wrote to me since my last, he is a poor weak fellow, with a good natural disposition, but so little to be depended upon, that he is turned round by every feather, after inserting that he could not go on "in my service" as he called it, under *ten dollars* a week, he now says he should be most happy to receive *four*. He says not one word of his marriage, which proves his wish to deceive one. I have done with him.

My Boxes are in possession of Mr. Gilpin & shall thank you to procure them from him, and bring them back for me, they will hold your own things on the voyage.

I hope you have got for me *lots of River shells*. Mrs. Swainson writes in kind wishes, and the little children often talk of you, and ask me when you will come back.

Your sincere friend

W. Swainson

30 Jany 1830

J. J. Audubon Esq.

care of Mr. Havell

EXTIRPATED WEST INDIAN BIRDS.

BY AUSTIN H. CLARK.

IN THE present paper I have brought together all the evidence as to the existence in former years of birds not known at the present day on the islands of Barbados, St. Vincent, the Grenadines, and Grenada (with the exception of the members of the family Psittacidæ), and have given them what appears to me to be (in the light of my recent studies in West Indian ornithology) their proper standing.

Some of the birds represent (as the Purple Gallinule, *Ionornis martinica*) merely locally extirpated colonies of wide ranging species, while others (as *Cinclocerthia*) were probably subspecifically or even specifically distinct from those on the neighboring islands.

? *Podilymbus podiceps* (Linn.).

PIED-BILLED GREBE.

The Two-Penny Chick HUGHES, Nat. Hist. Barbados, p. 71 (1750).

Podiceps dominicus, The Two-Penny Chick SCHOMB., Hist. Barbados, p. 682 (1848). — FEILDEN, Ibis, 1889, p. 503; W. I. Bull., III, p. 352 [1902].

Hughes mentions a Grebe "of the Bigness and much the Colour of the *American* Quail" as occurring in Barbados in his day. Schomburgk also in his list includes a Grebe under the name of *P. dominicus*. *P. dominicus* has never been found in the Lesser Antilles, but *Podilymbus podiceps* is a breeding resident in many, if not most of the islands, and there is a specimen in the British Museum from Barbados. It is not known there at the present time. The name "Two-Penny Chick," formerly applied to the Grebe, is still used on the island, but now refers entirely to the Sora (*Porzana carolina*).

Col. Feilden has followed Schomburgk in giving the Grebe as *P. dominicus*; but for the reasons given above I prefer to regard it as *Podilymbus podiceps*.

Buteo (? antillarum Clark).

WEST INDIAN BUZZARD.

Bussard LIGON, Hist Barbados, p. 60 (1673)*Milan* LIGON, Hist. Barbades, p. 101 (1674).*Buteo borealis* SCHOMB., Hist. Barbados, p. 681 (1848).

Ligon says: "The birds of this place [Barbados] (setting two aside) are hardly worth the pains of describing, yet, in order, as I did the beasts, I will set them down. The biggest is a direct Bussard, but somewhat less than our Grey Bussard [*B. buteo*] in England, somewhat swifter of wing; and the only good they do is sometimes to kill the rats."

Schomburgk gives "*B. borealis*" as a resident on Barbados. Probably he refers to this species or a closely related form (as it is abundant on the neighboring islands of St. Vincent, Grenada, and Dominica) for *B. borealis* does not occur in the Lesser Antilles, except, perhaps, on St. Kitts.

Hughes (1750) does not mention any hawk.

At the time Ligon wrote the greater part of Barbados was still clothed in natural forest, and it is very probable that this hawk was then resident.

NOTE.—*Falco columbarius* is given by Schomburgk as a resident on Barbados (Hist. Barbados, p. 681, 1848). Col. Feilden (Ibis, 1889, p. 489; W. I. Bull., III, 342, [1902]) believes him to be in error, and he is not confirmed by other authors. However, there is a possibility that it did breed there in his time, as it is said to be a permanent resident on the island of Dominica, and occurs in all these islands as a fall and winter visitor.

Ionornis martinica (Linn.).

PURPLE GALLINULE.

Blue-Pated Coot HUGHES, Nat. Hist. Barbados, p. 71 (1750).

Ionornis martinica FEILDEN, Ibis, 1889, p. 499; W. I. Bull., III, p. 349 [1902].

I have no hesitation in referring Hughes "Blue-Pated Coot" to this species. He says, "They (Coots or Moor-Hens) are distinguished into Three Kinds; The White- [*Fulica americana*], the Red- [*Gallinula galeata*], and the Blue-Pated." They were apparently common in Barbados in his day.

At the present time it is only accidental on Barbados, although common on Dominica. St. Lucia, St. Vincent, the Grenadines, and Grenada.

NOTE.—*Gallinula galeata* and *Fulica americana* (probably referable to *F. caribæa* Ridgw.) are both now exceedingly rare on Barbados, although they were formerly abundant. Col. Feilden obtained a nest of the former in July, 1888, and found a few of the latter in Græme Hall Swamp in the same year. If not already gone, their extirpation is only a matter of a few years. I found no examples of either.

Columba squamosa Bonn.

RAMIER.

? *Pigeons* SLOANE, Nat. Hist. Jamaica, I, p. 34 (1707).

The Wild Wood Pigeon HUGHES, Nat. Hist. Barbados, p. 76 (1750).

Sir Hans Sloane writes, speaking of Barbados, that "Turner (ap. Purchas. p. 1265) found Hogs, Pigeons, and Parrots there."

Hughes says of "The Wild Wood Pigeon": "This is about the Bigness of an House Pigeon. The Head is of a blackish Colour; and from the under Bill to the Breast, of a light Mouse-Colour; from thence to the Belly and the under Part of the Tail, of an Ash-Colour; the upper Side of the Neck, Back, and Wings, of a dark Ash-Colour, growing lighter toward the Extremities of the Wings.

"These come hither, tho' in no great Numbers, about the latter End of July or August, always alighting upon Trees, and feeding upon the Berries of them."

Although the coloration is rather inexact, Hughes probably refers to this pigeon, as the size is pretty close, and he mentions

its exclusively arboreal habits. *Columba squamosa*, although abundant on the neighboring islands, does not now visit Barbados, possibly because of the cutting down of the forests.

***Geotrygon montana* (Linn.).**

PERDRIX.

This bird appears to be now extirpated from St. Vincent, possibly as a result of the importation of the mongoose. I am told that it has disappeared from St. Kitts, and is becoming rare on other islands, more especially on Grenada.

***Strix* (? *nigrescens* Lawr.).**

OWL.

Strix flammea SCHOMB., Hist. Barbados, p. 681 (1848).

Schomburgk includes "*S. flammea*" in his list of the birds of Barbados. No other author mentions any owl, but possibly some form of this genus occurred when the island was largely under forest. It may have been *S. nigrescens*, at the present time a common resident on Dominica, St. Vincent, Bequia (Grenadines), and Grenada.

NOTE.—*Colinus virginianus* (Linn.) is included by Schomburgk in his list of the birds of Barbados. There appears to be no evidence that this bird ever lived there, although it is resident on several of the more northern islands. Possibly he came into the possession of a stray specimen captured in the island, as he obtained in this way a specimen of the Ruff (*Paroncella pugnax*). A Quail was shot in Barbados in September, 1886, and another seen in September, 1887.

***Cinclocerthia* sp.**

QUAKING THRUSH.

Thrush LIGON, Hist. Barbados, p. 60 (1673).

Grive LIGON, Hist. Barbados, p. 101 (1674).

Quaking Thrush HUGHES, Nat. Hist. Barbados, p. 72 (1750).

Turdus jamaicensis (!) SCHOMB., Hist. Barbados, p. 681 (1848).

Ligon says: "The next is a bird like a Thrush, of a melancholy look, her feathers never smooth, but always ruffled, as if she were mewing, her head down, her shoulders up, as if her neck were broke. This bird has for three or four notes, the loudest and sweetest that I ever heard; if she had variety, certainly no bird would go by her; she looks always as if she were sick or melancholy."

Hughes writes: "We have Two species of Thrush in this Island." One "is a solitary Bird, and is known by the name of the *Quaking Thrush*."

Schomburgk gives "*Turdus jamaicensis*" in his list, calling it the "Quaking Thrush."

The members of the genus *Cinclocerthia* all have a peculiar habit of occasionally shivering or shaking, as if afflicted with ague, which has given them the name of "Trembleur" in all the islands where they are found at the present time. This habit is not shared by any other Lesser Antillean genus, so we appear to be justified in referring the "Thrushes" of the authors mentioned to *Cinclocerthia*. I interpret Ligon's statement that the bird always appears "sick or melancholy" to have reference to this peculiarity also, a comparison between the shivering of the bird and the shaking of a person ill with a tropical fever.

At the present time, *Cinclocerthia* occurs on all the islands from Guadeloupe south to St. Vincent, as well as on some of the more northern Lesser Antilles. It was probably driven from Barbados by the deforestation of that island.

Allenia (? albiventris Lawr.).

" WREN."

Wren LIGON, Hist. Barbados, p. 60 (1673). HUGHES, Nat. Hist. Barbados, p. 73 (1750).

Roytelet LIGON, Hist. Barbades, p. 101 (1674).

Ligon says: "Another there is, not unlike a Wren, but big as a Thrush; and this is as merry and jolly as the other [*Cinclocerthia*] is sad; and as she sits on a stick, jets, and lifts up her train [tail], looking with so earnest and merry a countenance, as if she would

invite you to come to her, and will sit till you come very near. This bird I never heard sing."

Hughes writes: "The Wren. This, excepting its Note and Bill, differs very little from the Thrush, as to its Plumage and Bigness. Its Bill is somewhat more sharp pointed and longer than that of the Thrush.

"It is most commonly to be seen in the Wood near Hackleton's Clift, and feeds chiefly upon Oranges and such ripe Fruit, as well as upon Lizards."

I believe that there can be no doubt that these descriptions refer to an *Allenia*. The habit of keeping the tail in the air like a wren is very characteristic, and in its actions it is lively and restless. If it inhabited Barbados, one would expect it to be found in the rugged country about Hackleton's Cliff and in the Scotland District, and not in the level portions of the island, as it is a bird of the hills.

A. albiventris (Lawr.), the only species of the genus, occurs from St. Eustatius to St. Vincent, and also on Grenada.

Margarops sp.

"COUNSELLOR."

Counsellor LIGON, Hist. Barbados, p. 60 (1673).

Counseiller LIGON, Hist. Barbades, p. 102 (1674).

Thrush HUGHES, Nat. Hist. Barbados, p. 72 (1750).

Turdus mustelinus (!) SCHOMB., Hist. Barbados, p. 681 (1848).

Ligon writes: "The next is of the colour of a Fieldfare [*Turdus pilaris*], but the head seems too big for her body, and for that reason they call her Counsellor; her flying is extremely wanton; and for her tune, 'tis such as I have not heard any like her, not for the sweetness."

According to Hughes: "We have two Species of Thrush in this Island; the one much resembling in her note the English Thrush.

"As soon as the Day appears, she mounts up like a Lark into the Air, almost out of Sight."

Of the two "Thrushes" included by Schomburgk in his list, "*Turdus jamaicensis*" must refer to a plain colored bird without

any distinctive markings; as he also gives it the name of "Quaking Thrush," we refer it to *Cinclocerthia*; the other, "*T. mustelinus*," is probably the second species mentioned by Ligon and Hughes; there is, however, a possibility that he refers to *Allenia* under this name.

I have referred these "Thrushes" to *Margarops* and not to *Cinchlerminia*, as the former genus is more widely distributed, its species more abundant where they occur, and not essentially birds of the deep woods (as are the species of *Cinchlerminia*), and the habits as given agree better with those of *Margarops*. Moreover, a male of *M. fuscatus densirostris* (a straggler) was obtained on Barbados on March 2, 1889.

Cœreba atrata Lawr.

Normal Form = *saccharina* Lawr.

MOLASSES BIRD.

The Yellow-breasted Honey Creeper appears to have become extinct on St. Vincent. I could find no trace of it. Ober obtained two specimens in 1878, but Lister, writing in 1880, does not mention it. It seems to be now wholly replaced by the black form (*atrata* Lawr.).

Cœreba wellsi Cory.

Normal Form.

SUCRIER.

Ober says (1878) that "this bird is not found in great numbers (on Grenada), as in some of the northern islands (? northern Lesser Antilles, or Grenadines); indeed I have seen it but twice on the mangrove flats of Point Saline." This is inserted under the heading "*C. atrata*," but must refer to this bird, as the black form is abundant all over Grenada. Wells says it is not found at all in Grenada.

In May, 1904, while at St. George's, Grenada, Mr. Charles

Vernet very kindly presented me with a specimen of this bird, taken by himself at Point Saline; it was the only one he ever saw.

It is abundant on all the Grenadines.

Besides these forms, I failed to find the following on St. Vincent, although I explored almost the whole island very carefully. Possibly they still exist in limited numbers in certain remote localities.

Catharopeza bishopi (Lawr.).

Cinclocerthia ruficauda tenebrosa Ridgw.

Cinchlerminia sanctæ-luciæ (Scl.).

Allenia albiventris (Lawr.), which became a common resident on Union Island and Carriacou, Grenadines, after the great hurricane at St. Vincent in 1898, has now entirely disappeared from those islands.

THE LESSER ANTILLEAN MACAWS.

BY AUSTIN H. CLARK.

WE FIND mentioned by the earlier writers who dealt with West Indian ornithology, a number of birds which are not known to inhabit the islands at the present day, and which have been extinct for many years. In this paper I shall bring together all the evidence existing as to the presence of Macaws in the Lesser Antilles, in the islands of Guadeloupe, Dominica, and Martinique.

These three islands collectively show affinities to the Greater Antilles and to South America, at the same time having genera and species peculiar to themselves. For instance, a species of *Mimocichla* (Dominica) and a species of *Melanerpes* (Guadeloupe), together with the fact that *Guara alba* is a breeding resident on Dominica, appear to show a Greater Antillean relationship; *Dendroica rufigula* (Martinique), *Stenopsis cayenensis* (Martinique), *Ceryle stictipennis* (Guadeloupe and Dominica), and *Rup-*

*ornis magnirostris*¹ (Martinique) seem to ally them with South America; while *Cinchlerminia*² (Guadeloupe, Dominica, and Martinique), *Rhamphocinclus brachyurus* (Martinique and St. Lucia), *Saltator guadeloupensis* (Guadeloupe, Dominica, and Martinique), and *Thalurania bicolor* (Dominica) demonstrate that as a group they are distinct from the islands around them.³

We must admit, then, the possibility of these three islands having had upon them species of the genus *Ara* (which is found in the Greater Antilles, Central, and South America), even although it is unknown from any of the other Lesser Antilles.

Dutertre (1654) is the first to give an account in detail of the ornithology of these islands. Under the heading "*De l' Arras*" (p. 294) he says: "We have in Guadeloupe three of the parrot kind, viz: — Macaws, Parrots, and Parrakeets, each different from those which inhabit the neighboring islands; for each has its parrots different from those of the others in size, voice, and color.

"The Macaw is the largest of all the parrot tribe; for although the parrots of Guadeloupe are larger than all other parrots, both of the islands and of the main land, the Macaws are a third larger than they.

"The head, neck, underparts, and back are flame color. The wings are a mixture of yellow, azure, and scarlet. The tail is wholly red, and a foot and a half long. The natives hold the feathers of the tail in great esteem; they stick them in their hair, and pass them through the lobe of the ear and the septum of the nose to serve as mustaches, and consider themselves then much more genteel and worthy of the admiration of Europeans.

"This bird lives on berries, and on the fruit of certain trees, but principally on the apples of the manchioneel (!), which is a powerful and caustic poison to other animals. It is the prettiest sight in the world to see ten or a dozen Macaws in a green tree.

¹ *Vide* Gurney, *Ibis*, 1876, p. 482.

² One species is found on St. Lucia also.

³ St. Lucia, with a resident South American species (*Anistrostomus rufus*) and two peculiar genera (*Melanospiza* and *Leucophaea*), together with a species of *Cinchlerminia*, is most nearly allied to them.

Their voice is loud and piercing, and they always cry when flying. If one imitates their cry, they stop short. They have a grave and dignified demeanor, and so far from being alarmed by many shots fired under a tree where they are perched, they gaze at their companions who fall dead to the ground without being disturbed at all, so that one may fire five or six times into the same tree without their appearing to be frightened.

“The natives make use of a stratagem to take them alive ; they watch for a chance to find them on the ground, eating the fruit which has fallen from the trees, when they approach quietly under cover of the trees, then all at once run forward, clapping their hands and filling the air with cries capable not only of astounding the birds, but of terrifying the boldest. Then the poor birds, surprised and distracted, as if struck with a thunderbolt, lose the use of their wings, and, making a virtue of necessity, throw themselves on their backs and assume the defensive with the weapons nature has given them — their beaks and claws — with which they defend themselves so bravely that not one of the natives dares to put his hand on them. One of the natives brings a big stick which he lays across the belly of the bird, who seizes it with beak and claws ; but while he is occupied in biting it, the native ties him so adroitly to the stick that he can then do with him anything he wishes.

“The flesh of this bird is very tough, and considered by many unwholesome, and even poisonous. I never had any ill effects from it, although we inhabitants often eat it.”

In a later work (1667) Dutertre gives practically the same account, but he says that the Macaws only eat the manchioneel apples in case of necessity (II, p. 247). He says further (II, p. 249), “The male and the female are inseparable companions, and it is rare that one is seen singly. When they wish to breed (which they do once or twice a year) they make a hole with their beaks in the stump of a large tree, and construct a nest with feathers from their own bodies. They lay two eggs, the size of those of a partridge (*Perdix cinerea*). The others of the parrot kind make their nests in the same way, but lay green eggs. . . . The Macaws are much larger than the large parrots of Guadeloupe or Grenada, and live longer than a man ; but they are almost all subject to a falling sickness.”

In the "Histoire Naturelle et Morale des Isles Antilles de l'Amérique" (1658; 1665) we find the following (p. 154, 2nd ed., p. 170): —

"The Macaws are preëminently beautiful birds, the size of a pheasant; but they resëmble parrakeets in the shape of their body. Their head is large, their eyes bright and bold, their beak hooked, and they have a long tail composed of beautiful feathers which are of different colors in the different islands where they live. There is a kind which has the head, the back, and the wings pale yellow, and the tail entirely red. Others have nearly the whole body flame color, except that they have in their wings feathers of yellow, blue, and red. Still others are found which have the whole plumage a mixture of red, white, blue, green, and black; that is, five colors, which forms a very pleasing combination. They commonly fly in flocks. One judges by their actions that they are bold and resolute, for they are not alarmed by the report of fire-arms, and if none are wounded at the first discharge, they await a second without moving from the place where they are; but there are many who attribute this boldness to their natural stupidity rather than to their courage. They tame very easily, but their tongue is too thick to enable them to speak as well as parrots and the smaller parrakeets. They are so sensitive to cold that it is difficult to bring them across the sea."

Labat (1742) says (II, p. 211): "The Macaw, which I place at the head of the parrots, is the largest of all the parrot tribe, either in these islands or on the mainland. It is the size of a full grown fowl. The feathers of the head, neck, back, and underparts are flame color; the wings are a mixture of blue, yellow, and red; the tail, which is from fifteen to twenty inches in length, is wholly red. The head and the beak are very large, and it walks gravely; it talks very well, if it is taught when young; its voice is strong and distinct; it is amiable and kind, and allows itself to be caressed."

He also says (II, p. 211): "There are Macaws, Parrots and Parrakeets in each of our islands, and it is easy to tell from their plumage from which island they have come. Those from Guadeloupe are generally larger than the others, but the parrakeets are smaller."

Buffon (Hist. Nat. Ois., VI, p. 181, 1774) states that Macaws occur in all the warm parts of America, and in the West Indies. He says further (*l. c.*, p. 177): "Christopher Columbus in his second voyage touched at Guadeloupe and found there Macaws, to which he gave the name of 'Guacamayas.' He met with them only in the uninhabited islands, and they were by far the most beautiful ornaments of the gloomy forests which covered the land given up to nature."

Brisson (Orn., IV, p. 183, 1760) says (under "L'Ara Rouge"), quoting from a letter from M. de la Borde, Médecin du Roi at Cayenne: "In all the islands (Antilles) the Macaws have become very rare, because the inhabitants destroy them for food. They retire into the unfrequented districts, and do not come near the cultivated areas."

Edwards says (Birds, IV, p. 158, 1751): "This bird ('The Red and Blue Maccaw') is a native of America, and, I believe, is found everywhere between the tropics, not only on the continent but on some of the American islands."

Latham says of the "Red and Blue Maccaw" (Gen. Hist. Birds, II, p. 102, 1822): "Inhabits Brazil, Guiana, and other parts of South America, and, we believe, some of the islands also, but becomes scarce or wholly eradicated in proportion to the increase of inhabitants."

From the foregoing we appear to have ample proof that there were Macaws in these islands; we are told also that they were becoming rare before 1760 (Brisson). That the various members of the parrot tribe are among the first to be exterminated from any given locality, especially if the species be confined to an insular habitat, we learn from the cases of *Nestor productus* Gould (Philips Island), *N. norfolcensis* Pelz. (Norfolk Island), *Lophopsittacus mauritianus* (Owen) (Mauritius), *Necropsittacus rodericanus* (Milne-Edw.) (Rodriguez), *Mascarinus mascarinus* (Linn.) (Réunion), and *Palaeornis exsul* Newt. (Rodriguez); and so, everything considered, I believe we are justified in giving credence to the writings of the three principal authors quoted. That they knew of the different conditions which pertain in the different islands is brought out in their remarks about the parrots being different in the different islands, and also by the account of the Armadillo

given by Dutertre and Labat. Both record this animal as found only in Grenada, and say that it cannot be introduced into the other islands. To-day Grenada is the only island (except, of course, Tobago and Trinidad) where the Armadillo is found, and it is there known by the same name that they give it — Tatu.

The Lesser Antillean Macaw, as described by Dutertre, had "the head, neck, underparts, and back, flame color; wings azure, yellow, and scarlet; tail red, 18 inches long." Labat says: "Head, neck, back, and underparts flame color; wings blue, yellow, and red; tail red, 15 to 20 inches long."

This shows that the bird differed from *A. macao* in (1) having the tail wholly red; in *A. macao* the two central feathers are red, the others with blue tips, increasing in extent to the outer pair, which are almost wholly blue; and (2) in having a shorter tail (? smaller¹); the tail of *A. macao* is two feet long.

From *A. chloroptera* it differed (1) in having a wholly red tail (*A. chloroptera* has even more blue in the tail than *A. macao*); (2) in having yellow on the wings, and (3) in having a shorter tail (? smaller); the tail of *A. chloroptera* is 21 in. long.

From *A. tricolor* it differed in (1) having yellow on the wings, and (2) in having a much longer tail (? larger); the tail of *A. tricolor* is 10 in. in length.

Dr. Latham has figured and described (Gen. Hist. Birds, II, p. 107, pl. xxi, 1822) under the name of the "Red and Yellow Maccaw," a bird entirely scarlet, except the posterior half of the wings, which is yellow; the lower rump, and tail coverts are rose white. The bird came from Trinidad (!) (probably Guiana or Venezuela), and appears to be a variety of *A. macao*.

D'Aubenton (Pl. Enl. 12, "L'Ara Rouge") figures a bird with all the tail feathers red (central pair and three on right side shown), and with much more red on the scapulars and tertials than in *A. macao*. There appears to be a possibility that the fig-

¹ In the Macaws the relative length of tail and wing, or of tail and total length is variable, so that we cannot say with certainty that the bird was smaller. *A. tricolor* measures, tail 10 in., wing 11 in., total length about 18 in.; *A. ararauna*, tail 12 in., wing 14 in., total length about 31 in.; *A. macao*, tail 23.5 in., wing 16 in., total length about 31 in. In the green Macaws the wing and tail are about equal in length.

ure is from a West Indian bird, although it is regarded by systematists as a specimen of *A. macao*.

The names which have been applied to Red and Blue Macaws are all referable to *A. macao* or to *A. chloroptera*. Linnæus (Syst. Nat., I, p. 139, no. 1, 1766), under [*Psittacus*] *macao*,¹ refers to the Pl. Enl. 12; but in his description says "rectrices rubræ, lateralibus cæruleis," his diagnosis being referable to *A. macao* as now understood. *Ps[ittacus] aracanga* Gmelin (Syst. Nat. I, p. 313, 1788) et auct., *Ara canga* Levaill. (Perr., I, pl. 2, 1801) and *Sittace coccinea* Reichenow (J. f. O., 1881, p. 267) are all referable to *A. macao*.

I believe we are justified in admitting provisionally into the avifauna of the Lesser Antilles a red, yellow, and blue Macaw, under the name of

Ara guadeloupensis.

LESSER ANTILLEAN MACAW.

Characters. Apparently similar to *A. macao* Linn., but smaller (tail 15 to 20 in. long [Labat]; 18 in. long [Dutertre]), and with the tail wholly red.

Habitat. Guadeloupe (extinct); ? Dominica (extinct); Martinique (extinct).

Ara DUTERTRE, Hist. Générale des Isles des Christophie, de la Guadeloupe, de la Martinique, et autres dans l'Amérique, p. 294 (1654); Hist. gén. des Antilles habitées par les François, II, p. 247 (1667).² — ANON.,³ Hist. Nat. et Morale des Isles Antilles de l'Amérique, p. 154 (1658), 2nd ed., p. 170 (1665). — LABAT, Nouv. Voyage aux Isles de l'Amérique, contenant l'histoire naturelle de ces pays, II, p. 211 (1742). — BUFFON, Hist. Nat. Ois., VI, p. 181 (1774) (part).

¹ The name "macao" was given to this bird because it was first supposed to have come from Macao, near Hong Kong. The English "Macaw" is supposed by some to be derived from it.

² In the title it says "en deux tomes," but three volumes were published — Vol. I (1667); Vol. II (1667); and Vol. III (1671), entitled "Histoire Générale des Ant-Isles habitées par les François" (Paris). The spelling "Ant-Isles" is to agree with a theory of the author's as to the derivation of the word "Antilles."

³ This book was published at Rotterdam; other early writers refer to it as being the work of C. César de Rochefort.

L'Ara Rouge, ? D'AUBENTON, Pl. Enl. 12. — BRISSON, Orn., IV, p. 183 (1760) (part).

The Red and Blue Maccaw (part) EDWARDS, Birds, IV, p. 158 (1751). — LATHAM, Gen. Hist. Birds, II, p. 102 (1822).¹

NESTING HABITS OF BIRDS IN MISSISSIPPI.

BY CHARLES R. STOCKARD.

(Concluded from p. 158.)

THE FOLLOWING observations complete a summary appearing in this journal of the nesting habits of birds recorded by the writer in Mississippi from 1895 to 1903 inclusive. As stated in the introduction to the former article, no attempt is made to enter into the details of nest building and such matters as are commonly known. Only the important facts regarding nesting seasons, places, and peculiarities are stated, these being of general interest coming from a locality hitherto not specially observed.

45. *Cyanocitta cristata*. BLUE JAY (concluded). — The outside of the Jay's nest is composed of coarse sticks and above these is then daubed and plastered a thick coat of mud; here the work seems to stop for several days, apparently to allow the mud to dry and harden more advantageously than it would if immediately covered with the lining of fibrous roots which is to be later added. In many cases cloth, paper, strings, leaves, etc., enter into the composition of the nest. One was found with no lining whatever, the eggs being deposited on the hard mud floor.

The sets taken early in the season contained almost invariably five eggs while those observed near the close of the laying time, about the last of May, consisted of only four. Whether these late sets were second layings of the season or not I am unable to state, but in some instances such was apparently not the case. The Blue Jay's earliest set was found March 29, 1899, and the latest June 5, 1897.

46. *Corvus americanus*. AMERICAN CROW. — The Crow is common throughout the State and detested by most farmers as a corn consumer.

¹ The references to Latham's 'Index' and 'Synopsis' are given in this book.

A total of forty-two nests were visited, all situated in pine trees with the exception of two that were in large water oaks and one in a hickory. In each case the nest tree was in dense foliage with the one exception of that in the hickory, which was utterly bare, and the nest was fully exposed to view on three of its sides. One nest was only twelve feet up in the forks of a dwarfed pine, while another was about seventy feet from the ground in a large water oak, the average distance from the ground being about forty feet. The nest tree always stood in more or less of a wood, never out in a clearing. In the east central part of the State nearly all nests contained five eggs, while in the southwest portion only one set of five was taken, all others containing only four eggs. March 9, 1901, the earliest set was collected and the latest was found on April 22, 1900. The Crows generally became very noisy in the neighborhood of the nest tree as soon as one had well started on his climb, so that the observer felt almost certain about the condition of the nest that he was struggling to reach.

47. *Agelaius phoeniceus*. RED-WINGED BLACKBIRD. — This was by far the most plentiful blackbird of the marshes, and often nested in considerable colonies. A small marsh in Lowndes County was found to contain on May 30, 1896, forty-seven occupied nests of these birds. The marsh was not visited again for three years; then only nineteen nests of the season were found. This falling off in numbers was probably due to the fact that the fields near the marsh were now under cultivation, and that the farmers tried to destroy these birds, which are very fond of corn and are often industrious enough to scratch it up shortly after it has been planted. In the spring of 1901 eleven nests of the Red-wing were found in a peach orchard which was located one mile from the Mississippi River, but the ground was dry and not at all marshy. I never saw the nest actually placed on the ground but have found several only a foot from it, and have visited others twenty-five feet up, but they were generally situated about six or eight feet high in small shrubs or bushes. The nests were plaited in between the prongs of vertical forks or fastened to the stalks of several reeds growing close together. The set generally contained four eggs, though in many cases it consisted of only three. Their nesting time was rather late in the season, the limiting dates noted being May 12 and June 27; the height of the breeding time was about June 1.

48. *Sturnella magna*. MEADOWLARK. — The pleasant call of this bird is the most familiar note of many fields and pastures. Its nest is placed in a slight depression on the ground near the base of a small bush or tuft of sedge or other grass. The nest is as a rule arched over the top in oven-bird fashion, but is again sometimes almost roofless. The female is usually found at home and will allow one to approach within a few feet before she is flushed, then she flutters and staggers off as if utterly unable to fly, as was noted above in reference to the Mourning Dove, Killdeer, Chuckwill's-widow, and is a common trick of many smaller birds that

nest on the ground. No doubt this serves them well in drawing off other animal intruders from their eggs and young. I have seen an untrained dog follow a bird for many yards snapping at her every few paces until she was a safe distance from her nest when she arose and flew swiftly away to a perch from which she might watch results. The pursuer was so dismayed at her ability to escape that he would rarely turn to go back in the direction of the nest, and it was highly probable that in his intense interest in the chase the nest was entirely overlooked. The extreme dates of noting these eggs were April 29, 1898, and June 7, 1896.

49. *Icterus spurius*. ORCHARD ORIOLE. — This species was rather abundant in all parts of Mississippi while the following one, *galbula*, was locally distributed. The cup-shaped nest of *spurius* is easily found in orchard trees as well as in the trees along roadsides and in many groves. Though the nest is not quite so deep as that of the Baltimore it is just as artistically constructed yet not so gracefully swung. The grass forming the outer nest wall is in some cases a rich golden while in others it has a decided greenish tinge, giving in each instance a neat new appearance. On May 17, 1900, a set of seven eggs of this species was taken, which is larger than any other set that the writer has seen recorded for this bird. The earliest full set was found May 4, 1899, and the latest on June 8, 1900. Most sets contained five eggs but six was not uncommon. Finally mention should be made of two nests that were extremely interesting in their uniqueness. In both cases these nests were completely hidden and tucked away in large masses of Spanish moss which swung from the limbs of live oak trees. The birds had worked their way into the moss and constructed their nest, using, however, the ordinary building material and not the moss which served only to conceal and suspend their home. These nests were very attractive pieces of bird work.

50. *Icterus galbula*. BALTIMORE ORIOLE. — The distribution of this bird was rather remarkable; in many counties it was not seen at all, while in other parts of the State it was as plentiful as the Orchard Oriole. Adams County was more highly favored by its presence than any other section closely observed. I found near Natchez as many as four occupied nests in a single oak tree. The nests were either tied or plaited to the prongs or forks with cotton cord or various strings, and when these seemed not available grass blades and stems served equally as well. The sets were generally composed of five eggs and were all collected during the month of May.

51. *Quiscalus quiscula*. PURPLE GRACKLE. — These grackles were found nesting in the trees of small marshes and also in the large oaks and gums of hill sides. They nested more or less in company and no nest was found situated alone. Several nests were often placed in the same tree. In the Lowndes County marsh mentioned in connection with the Red-winged Blackbirds this grackle also nested in large numbers. Their nests were placed overhead in the gum and willow trees while the Redwings occupied the bushes below. On May 30, 1896, in this marsh

fourteen occupied nests of the grackle were found. In Oktibbeha County was a low hill-top on which stood about ten large gum trees, and the Purple Grackles built in these each season. Most sets contained five eggs but four was not an uncommon complement. The earliest set was noted May 3, 1896, and the latest June 6, 1899.

52. *Quiscalus major*. BOAT-TAILED GRACKLE. — These birds were rarely seen, but on one occasion a marsh was visited in which they nested, though it was too late for their laying season, the date being June 21. The newly fledged young were fluttering about and many of the adults were flying nervously from tree to tree.¹

53. *Passer domesticus*. ENGLISH SPARROW. — As in almost all parts of the country this sparrow is truly a nuisance in Mississippi. No one after observing can doubt the fact that these pests are driving many native birds into the background. They have taken possession of many martin houses, bluebird and woodpeckers' nests, as well as every other available cavity they can find. They nest under the eaves of houses and in the vines clinging to the walls of buildings. Thus some buildings with vine-covered walls have at times become almost uninhabitable on account of the bird lice that wander all through the house from the nests in the vines. There was a church in Columbus the walls of which were completely covered with ivy and the ivy was almost as completely filled with sparrows' nests. Permission was obtained to raid this colony and in one day four hundred and fifty-nine eggs were taken and about seven hundred young sparrows were killed. The mass of hay and trash used in building these nests was astonishing; it at least can never be held against the sparrow that she is too lazy to carry nest material unless on account of their compound nests mentioned below. Several compound nests were found, one a large ball of hay with three small openings each leading to a separate feather-lined chamber containing a set of eggs. Single nests were also seen containing a brood of feathered young and a set of slightly incubated eggs, which were probably warmed by the young, but of course this cannot be positively stated. In Mississippi these birds nest during almost the entire year, but no exact data were obtained as to the total number of sets produced by a single pair within twelve months.

54. *Spizella socialis*. CHIPPING SPARROW. — This sparrow was rather common along the edges of sparse woods and in young pine brakes. All nests found were hidden in the thick foliage of young pines from four to fifteen feet above the ground. A number of pairs were accustomed to nest year after year in the same young pine brake. May 7 the earliest set was taken, and sets were seen as late as June 10.

55. *Spizella pusilla*. FIELD SPARROW. — These birds select various

¹ Since this paper was sent to the printer I have found three large colonies of Boat-tailed Grackles nesting in Washington County. They began laying April 28, and all the sets contained five eggs each.

sites for nesting such as blackberry vines, low hawthorn bushes, and often the nest is tucked down into a tussock of sedge grass. The sparrows are common in the fields, along the edges of woods, and among the bushes bordering roadsides. A large number of sets were observed, most of them consisting of four eggs but many had only three. For so small a species their nesting season began rather early, eggs being found on April 14, 1900, and the latest were seen on May 21, 1896.

56. *Peucaea aestivalis bachmanii*. BACHMAN'S SPARROW. — Only one nest of this sparrow was found. The birds were very rare, being seldom seen. The one nest was built over a slight depression on the ground close beside a small bunch of weeds, and composed of dead grass blades and stems. It was totally roofed over and the eggs could only be seen by slightly stooping so as to look back under the roof where they lay upon the nest bottom of grass. The location was near a brake of mixed pine and oaks. The date of finding was May 14, 1896, and the nest contained four fresh eggs.

57. *Pipilo erythrophthalmus*. TOWHEE. — The Towhee is common in most of the small brakes and woods and its strong note is a familiar sound through the entire year. All the nests were placed in low thick bushes or vines, usually two or three feet from the ground; none were seen directly on the ground. They lay during the month of May and comparatively fresh sets were taken June 6, 1899, and June 3, 1902. There were always three eggs in the set.

58. *Cardinalis cardinalis*. CARDINAL. — The 'Redbird,' as it is generally termed through the Gulf States, was common everywhere, and so familiar has it become that the nest is often placed in the vines that shade the galleries and arch the entrances of houses. They were found nesting in rose bushes and vines of the flower gardens, and in orchards their nest was a common sight. When, on the other hand, they were found in the deep woods and the thickest canebrakes, they were very shy and would flit off of the nest sometime before the disturber came close to it, flying away to a safe distance and uttering their twitter at intervals until danger was past. Three eggs almost invariably constituted the set in this section; in the many seen only two or three contained four eggs. The Cardinal was an early nester, beginning about the tenth of April and fresh eggs are rarely taken after May 20. Some eggs were scarcely spotted at all while some were covered almost entirely by large light chocolate blotches. In sets of three eggs two were usually lightly marked while the third was so heavily spotted that it resembled its set mates only in size. In one set of four that I have all the eggs are similarly marked.

59. *Guiraca caerulea*. BLUE GROSBEAK. — This very interesting species was by no means a stranger in Mississippi, nor was it very common in many portions. The earliest set was found on May 9, and the latest on June 1. Several sets were found, all consisting of four eggs each.

In connection with this bird the following interesting and peculiar observation was made.—May 18, 1895, a nest containing four fresh eggs

was found in the bushes that bordered a country road in Lowndes County. This road was used in the fall and winter for hauling cotton and some of the lint remained tangled in the bushes throughout the year. The nest was placed three and one half feet from the ground in a crotch of a small gum bush, and the outer part of it was cotton giving the whole much the appearance of a ball of lint caught in the branches. This nest and set of four eggs were taken. Two weeks later, June 1, on chancing to pass along the same road and glancing toward the former nest bush a second nest was seen. This was exceedingly like the other, its outer part being of cotton, and was placed in the identical crotch from which the first had been removed. On approaching it was found also to contain four fresh Blue Grosbeak's eggs. This was rather quick work, building a nest and laying four eggs within fourteen days. These birds are not very common in this section and it looks highly improbable that two pairs would have selected the same fork of a bush during one season. Presuming that one pair built both nests, which seems to be the case, this is a most marked illustration of the lack of ability to select another site when one proves so unfavorable. Considering the promptness with which the nest was replaced evidently no attempt was made to choose another suitable bush from the many close at hand.

60. *Passerina cyanea*. INDIGO BUNTING.—This bunting was not a common bird, but it was often seen perched on the tops of bushes or the tip of a weed where it uttered its pleasant warble, more frequently about midday. The nests were found in low bushes and blackberry vines near the edges of fields, but were also found in dense cane thickets, in which locality the foundation of the nest was made entirely of cane leaves. The nest was placed only a few feet from the ground. The sets usually contained three eggs, rarely four. The earliest noted set was May 6, 1897, and the latest June 9, 1900.

61. *Passerina ciris*. PAINTED BUNTING.—In only one county of the State was this bunting seen.¹ In Claiborne County they were plentiful, though I did not have an opportunity to observe their nests. Directly across the river in Louisiana they were common almost everywhere and nests were easily found. The male was often caged and known by the foolish name 'pop.'

62. *Spiza americana*. DICKCISSEL.—The Black-throated Bunting, as this bird is also called, was commonly seen. The nests were occasionally found though only two were recorded before the spring of 1900. That spring a large field was located that had been planted in vetch the previous fall and by the first of May a long luxuriant growth completely covered the land. This arrangement evidently appealed strongly to the Dickcissels, for late in April they could be seen in all parts of the field,

¹ I have since found the Painted Bunting rather common in Washington County.

and they were singing during most of the day from the rails of the fence that surrounded it. I had collected in this district during the four previous seasons and had never observed one fourth as many of these birds in all as were now to be seen in this single field. How had they located the place and from where had they come? During the month of May fourteen nests were found and at least as many more could probably have been located with careful searching. The nests were placed in clumps of tangled vetch only a few inches above the ground. Eleven sets were composed of five eggs each and three contained four each. They were collected from May 9 to 23, 1900.

63. *Piranga rubra*. SUMMER TANAGER.—These birds seem to have a foolish fancy for building their nests on horizontal branches that overhang roadways. They were rather common and many nests were found each season, fully half of which were placed in trees along the wayside. The male was usually accommodating about leading the collector to his mate's nest, and one with slight experience in observing his antics could go almost directly to the nest tree. The observer finally felt that whenever he heard the male's call during the nesting season a Tanager's nest was soon to be noted. They build a neat home of smooth contour and always lined with a golden yellow grass straw or a similar greenish straw giving to the concavity of the nest a very characteristic appearance; the common 'pepper grass' stems make a favorite material for the outer layer. About one half of the sets contained four eggs while the others contained only three. Some of these eggs are so similar in appearance to those of some Mockingbirds that when a large number of the two kinds are scattered together it is not an easy task to discriminate between them. The earliest set was found April 28, 1896, and the latest June 6, 1900.

64. *Progne subis*. PURPLE MARTIN.—No farm cabin is complete without its martin-box or pole with several gourds strung near the top as nesting places for these birds. They also come to the smaller towns, though they are far less evident during the past several years, as the English Sparrow has usurped most of their breeding places. The eggs are generally deposited in May, and four or five compose the sets. A rather neat nest of sticks and straw is constructed.

65. *Riparia riparia*. BANK SWALLOW.—Along the perpendicular banks of rivers and creeks, in railroad cuts, and in the cliff-like hill sides many of these swallows were found digging their tunnels. They were numerous along the banks of the Tombigbee River where dozens of holes were often seen in a single cliff. They dig their own tunnels and in the back of these their nest of sticks and straw was placed.¹ May and the

¹ On May 2 of this year I found a Bank Swallow's nest placed in a Kingfisher's deserted tunnel. The tunnel was six feet long, and three feet from the entrance it made a bend of 45 degrees, and at this place the swallows had placed their nest.

early part of June constituted the chief laying season, and the sets consisted of four, five, and six eggs. One set of four eggs was taken April 21, 1897, which was the earliest set noted.

66. *Lanius ludovicianus*. **LOGGERHEAD SHRIKE.**—This species is commonly termed 'Butcher-bird,' on account of its well-known murderous reputation. The Shrike's favorite nesting places were orchard trees or the hawthorn bushes of open pastures. The nest was comparatively large and usually composed of a number of different materials but it was almost invariably thickly lined with wool and feathers. The sets contained either five or six eggs, the one number about as often as the other. March 30, 1898, was the earliest date of observing a complete set, and June 2, 1899, was the latest day on which eggs were found.

67. *Vireo olivaceus*. **RED-EYED VIREO.**—The Red eyed was the most plentiful vireo observed, and was usually to be found in all small brakes and woods. The pensile nest was swung from a small fork about ten feet up, though one was situated sixty feet from the ground in the top-most boughs of a gum tree. Three or four eggs constituted the sets. The extreme dates of finding full sets were May 9, 1897, and June 14, 1899. The birds were very shy when nesting. On leaving three partial sets to be completed, after I had merely looked into the nests, all three were deserted. Whenever an unfinished nest was molested in the slightest way, it was abandoned.

68. *Vireo gilvus*. **WARBLING VIREO.**—Only one nest of *gilvus* was seen, and the birds were not at all abundant. The nest was suspended from the prongs of a fork in a small oak sapling, and resembled very closely that of the Red-eyed. It was eighteen feet from the ground and contained a set of four fresh eggs on May 28, 1896.

69. *Vireo noveboracensis*. **WHITE-EYED VIREO.**—This vireo was almost as frequently seen as the Red-eyed. It confines itself, so far as observed, to rather deep woodlands, only in exceptional cases being seen along the roadsides. The nests were found in the low bushes that formed the undergrowth of woods. This nest is never to be confused with that of the Red-eyed by any one who has seen several of each; it is smaller in circumference, though deeper, and has a characteristic color, being composed of special material. The nests were usually placed about waist high. This vireo was also provokingly willing to abandon its home and eggs; whenever the nest was slightly disturbed it was very apt to be deserted, though the bird was apparently not in the vicinity when the offence was committed. Three eggs constituted the sets recorded and all were taken during the month of May.

70. *Seiurus aurocapillus*. **OVEN-BIRD.**—These birds were rare in those portions of Mississippi in which I collected. Only two were seen during the breeding season, though their call was occasionally heard. On May 26, 1895, the only nest was taken. It was constructed of leaves, grass, fibres, and straw, and was almost perfectly roofed over. This structure was placed at the base of a tuft of vines and grass and contained

five fresh eggs. The site was a wooded valley near the foot of a hill in Lowndes County.

71. *Geothlypis trichas*. MARYLAND YELLOW-THROAT. — This was by far the commonest of the few warblers found nesting in the State. Almost every marshy stream had its Yellow-throats. In the tussocks of grasses and rushes its nests were often seen. The nest of grass blades and small straws was tucked down into the center of these tussocks or placed on the ground at the base of such a clump. Many sets were found, all consisting of four eggs, and some were beautifully lined while others were speckled. April 28, 1896, was the earliest date of finding a nest, and in 1900 one was taken as late as May 26 containing a fresh set of four.

72. *Icteria virens*. YELLOW-BREASTED CHAT. — Nests of this bird are often found in the edges of sparse woods, along lake banks, and in the bushes of groves. The birds build in blackberry vines or small heavily leaved bushes, and the nest is composed of leaves and grass lined with fine grass straw. All complete sets consisted of four eggs.

In 1900 I noted a very interesting feat on the part of this bird; a similar performance was recorded above for the Blue Grosbeak. May 17 a nest containing four fresh eggs of the Yellow-breasted Chat was found in a hawthorn bush which stood near the edge of a small wood. The nest and set were taken from the bush and added to my collection. On May 26, only nine days later, strange as it may seem, while passing again along this wood border and looking toward the bush that had favored me on the 17th my surprise was to see a chat slide from her nest that now occupied the identical spot from which the other had been removed. This nest also contained a set of four fresh eggs, and it seems as certain as anything could be under the conditions that the same female built both nests and laid both sets. The eggs of the two sets when placed together were indistinguishable, and most observers appreciate the fact that a slight set difference exists among nearly all sets that are laid by different females.

92. *Mimus polyglottos*. MOCKINGBIRD. — No farmyard, garden, or meadow is complete without its pair of these master singers. The Mockingbird is also present in the towns and villages. On summer nights while the moon shines these birds seem to overflow with song, and their vocal performances often continue through almost the entire night; they may also be occasionally heard on perfectly dark nights.

In Mississippi the Mockingbird is sedentary, being present during the entire year. They seem strongly inclined to remain near a nesting site when it has been once chosen, and will often build year after year in the same bush or vine, although none have been found to use a nest for the second season. Six nests of the Mockingbird were once counted in a single large hawthorn bush; one of them contained eggs and the others were in different degrees of dilapidation; they were all probably the work of a single pair. This bird will nest in the vines shading a door or win-

dow and does not seem to object to having its eggs and young closely observed, provided they are not touched. Orchards and roadsides are their favorite nesting places. The nest is rather large and often bulky, the outer foundation consisting of coarse sticks; it is lined with various materials, such as moss, root fibres, etc. In 1902 a Mockingbird's nest was found in a hollow of an old pine stump, the only nest observed in such a place. Several nests were seen placed between the rails of fences and in piles of dead brush.

On May 30, 1897, two nests were found which contained runt or diminutive eggs; one held a single runt and three normal eggs while the other contained three runts about one third the natural size and one normal egg. These nests were in hawthorn bushes on the slope of a hill and not more than twenty-five paces apart. This is singular, since so few runts were seen among the great number of eggs observed.

While noting many Mockingbirds' nests the following happenings were observed:—If a nest and eggs were removed the parents would build another nest and deposit a second set of eggs, while on the other hand, as was seen in several cases, if by some mishap one or several eggs became broken in the nest the birds did not attempt to build or lay again that season, though they remained in the immediate vicinity.

The sets consisted of four or five eggs, and a series of them presented great differences in size, color, and markings. The earliest eggs were seen April 20, 1896, and the latest on June 24, 1899.

74. *Galeoscoptes carolinensis*. CATBIRD. — The Catbird was found more or less abundantly in most parts of the State; some localities, however, seemed entirely without them. In the east central portion they nest in the bushes bordering lakes, and the nests often overhang the water. They also nested in gardens and orchards and at times very near houses. The earliest complete set was noted on May 2, 1900, and the latest on June 17, 1899. All sets contained four eggs.

75. *Toxostoma rufum*. BROWN THRASHER. — This was one of the commonest species observed. They were found in the bushes along the edges of woods, in orchards and along the roadsides. The nests were usually placed in low bushes and vines, but some were high up in trees, and two were found on the ground under the edges of small brush piles. April 21, 1900, the earliest set was noted and June 8, 1899, the latest unhatched eggs were seen. A series of sets from this bird show great variations in their ground color and markings. Four or five eggs composed the sets. In the spring of 1897 a nest of the Mockingbird containing two of its own eggs also contained one egg of the Brown Thrasher.

76. *Thryothorus ludovicianus*. CAROLINA WREN. — More different places were selected by this bird for nesting sites than by any other observed. Nests were noted in tin cans placed under the eaves of sheds, in the eaves of well-houses, between the logs of cotton houses, in the hollows of low stumps, on the timbers under country bridges, between the

logs and weatherboarding of cabins, and strangest of all in the seat of an old pair of hunting trousers that hung on the wall of a farmhouse gallery. The nest was also found in brush piles. The birds were very conspicuous on account of their loud song, but the nest was often difficult to locate even when one was sure of its approximate position. These birds will often lay as many as three sets during one season, and they usually rear two broods within the summer. They are commonly termed in this section 'House Wren,' but of course are not confounded with the true House Wren. April 17 and June 18 are the extreme dates of observing sets. The set number was almost always five, rarely six.

77. *Sitta pusilla*. BROWN-HEADED NUTHATCH.—In the old pine deadenings of Adams County this small bird was found nesting in considerable numbers. They dug their own burrow but it was a badly botched affair, nothing about it suggesting the even smoothness of a woodpecker's hollow. The Nuthatch makes a small entrance through the bark of a dead snag, then usually, rather than burrow into the stump itself, they scooped out an irregular cavity by removing the soft wood that generally lies just under the bark. This burrow ran a crooked course but generally extended ten or fifteen inches below the entrance. In this cavity they placed a nest of soft fibers, moss, feathers, cotton, and wool. The burrows were usually only a few feet from the ground but one was found twelve feet up. The nests were best located by pulling the bark from pine stumps in a deadening where the birds were seen to be plentiful, unless one chanced to see them building or entering their burrow. On one occasion when the bark was pulled away exposing a nest while the female sat upon it, she could not be made to leave until pushed off with my finger.

These tiny birds are early layers, nesting at the time when the hawks, owls, and crows do. March 17, 1902, the earliest set was taken and the latest eggs were found on April 19. Sets consisted of five eggs.

78. *Parus bicolor*. TUFTED TITMOUSE.—Around the edges of woods, in deadenings, and often in groves the Tufted Titmouse was a common bird. The nests were found in natural cavities and in the deserted burrows of woodpeckers. This species, the Brown-headed Nuthatch, and Carolina Chickadee were often found nesting in the same vicinity, probably because they all select similar trees and stumps as homes. In the nest building of the Titmouse were used such materials as leaves, moss, fibrous bark, feathers and hair. The sets were composed of five and six eggs. On April 20, 1901, the earliest set was taken, and May 22, 1903, was the latest date on which eggs were found.

79. *Parus carolinensis*. CAROLINA CHICKADEE.—This bird nested in natural cavities and in the burrows of the smaller woodpeckers. The favorite sites were old fence posts which so often contain hollows. By walking along a line of posts in the country districts one seldom fails to find a Chickadee's nest. They also nested in deadenings where hollows were plentiful. All of the nests were composed partly of green moss,

other ingredients being feathers, cotton, wool, and fibers. Most sets contained five eggs but six were not uncommon, and Mr. R. P. Gillespie took a set in Oktibbeha County that contained nine,—these are now in a collection at the State Agricultural College. Most eggs were found during the month of April, and after the first of May nearly all nests contained young.

80. *Polioptila cærulea*. BLUE-GRAY GNATCATCHER.—Although this bird was often seen in most woods only two of its nests were found. The nests were composed of sycamore fuzz and other plant down, some hair, and small feathers as lining, while the outer part was almost completely covered with lichens so as to resemble very closely a mossy tree knot. The first nest was taken May 16, 1897, from an old honey locust tree near the edge of a wood. The second nest was found May 9, 1902, in another locust tree which was located in a small grove seventy yards from a college dormitory. Both sets contained four eggs.

81. *Turdus mustelinus*. WOOD THRUSH.—This handsome thrush was found rather abundantly in most low woodlands as well as in the yards of the towns. The nests were found placed on horizontal branches, often a considerable distance from the tree trunk. The outer wall of the nest was composed of sticks and leaves, which were plastered inside with a heavy layer of mud, the mud was then covered with fine fibrous roots as a nest lining, but these were often so thinly laid on that the mud was visible over almost the entire nest floor. Some sets had three eggs and others four. May 4, 1900, was the earliest set date and May 27, 1897, was the latest; most sets were taken about May 10.

82. *Merula migratoria*. AMERICAN ROBIN.—I have never observed this bird in Mississippi during the breeding season, though a collector in the northern part of the State once showed me a set of four Robin's eggs that he claimed to have collected in the county that year.

83. *Sialia sialis*. BLUEBIRD.—Bluebirds were found nesting in many kinds of cavities; the strangest nesting site observed was the hollow iron coupling of a flat car which stood for many weeks on a side track. The old style link and pin couple had a long hollow iron neck and back; in this neck a Bluebird had built its nest and deposited a set of five eggs. These birds lay several sets during the season if their eggs are taken away, and will often complete the set if the eggs are removed one by one. Sets of pure white eggs were observed on two occasions. On March 29, 1902, the earliest sets were taken and June 3, 1896, was the latest, this being a second set of the season. The number of eggs laid was either four or five.

The notes recorded above, with those which appeared under a similar title in the April number of this journal, may be conveniently summarized in the table below. The full meaning of the columns is to be understood as follows: The *number* refers to

the number placed before the name of the same species in the above articles; the *species* is given by the common name; under *occurrence* three terms are used: common — indicating that the bird was abundant and readily found; casual — birds not popularly known though not really rare; rare — birds that were seldom seen and few nests found; under *nest location* will be given the general character of the vicinity in which the nests were usually built; *earliest date* indicates the earliest date of the season on which I recorded nests of the given species; *latest date* the other extreme date; *maximum date* means the season during which most eggs of the species were to be found; *number of nests* is self-explanatory, but I may add that in several cases of the common species this number does not represent all the nests seen but only those specially observed.

No.	Species.	Occurrence.	Nest-location.	Earliest date.	Latest date.	Maximum date.	No. of nests.
1	Pied-billed Grebe	Common	—	—	—	—	—
2	Royal Tern	Common	Sandy islands	May 28	June 21	June	18
3	Cabot's Tern	Common	Sandy islands	May 28	June 21	June	16
4	Anhinga	Common	Swampy woods	Apr. 21	May 14	Apr. (late)	22
5	Least Bittern	Rare	—	—	—	—	—
6	Louisiana Heron	Common	Marshes	May 11	June 12	May	29
7	Little Blue Heron	Common	Marshes	Apr. 13	June 4	May	24
8	Green Heron	Common	Stream banks and marshes	May 5	June 11	May (late)	14
9	Black-crowned Night Heron	Casual	Marshy woods	Mar. 21	May 11	Apr.	13
10	King Rail	Rare	Reeds in marsh	June 29	—	—	1
11	Clapper Rail	Casual	Reeds in marsh	May 28	—	—	1
12	Sora	—	—	—	—	—	—
13	Spotted Sandpiper	Rare	—	—	—	—	—
14	Killdeer	Common	(Open fields	Apr. 17	June 6	May	31
15	Bob-white	Common	Hay Fields	June 3	June 29	June	42
16	Wild Turkey	Casual	Woods	May 14	May 26	May	2
17	Mourning Dove	Common	Pastures and hedges	May 1	June 19	May	51
18	Turkey Vulture	Common	Deep woods	Mar. 21	Apr. 25	Mar. (late)	5
19	Black Vulture	Common	Deep woods	Mar. 11	Apr. 19	Mar. (early)	13
20	Cooper's Hawk	Common	Deep woods	Mar. 2	Apr. 5	Mar. (mid.)	11
21	Red-tailed Hawk	Common	Deep woods	Mar. 3	Apr. 24	Mar. (mid.)	8
22	Red-shouldered Hawk	Common	Deep woods	Mar. 6	Apr. 18	Mar. (late)	15
23	Broad-winged Hawk	Rare	(Open pasture	Apr. 4	Apr. 13	—	3
24	Bald Eagle	Casual	—	—	—	—	—
25	American Sparrow Hawk	Common	Edges of woods	Mar. 18	Apr. 2	Mar. (late)	9
26	Barred Owl	Common	Deep woods	Feb.	Mar. 11	Feb.	8
27	Screech Owl	Common	Old fields	Mar. 14	May 3	Apr. (early)	17
28	Great Horned Owl	Rare	—	—	—	—	—
29	Yellow-billed Cuckoo	Common	Groves	May 5	June 21	May (late)	39
30	Belted Kingfisher	Common	Ciffs and stream banks	Apr. 28	June 7	May (early)	14

No	Species	Occurrence	Nest-location.	Earliest date.	Latest date	Maximum date.	No. of nests.
31	Ivory-billed Woodpecker	Casual	Edge of woods	Apr. 20	May 18	Apr. (late)	7
32	Downy Woodpecker	Casual	Woods	Apr. 1	May 8	Apr. (early)	17
33	Pileated Woodpecker	Common	Fields and pastures	May 12	June 14	May (late)	62
34	Red-headed Woodpecker	Common	Edge of woods	Apr. 24	June 2	Apr. (late)	20
35	Red-bellied Woodpecker	Common	Fields and pastures	Apr. 12	June 4	May (early)	65
36	Flicker	Common	Deep woods	May 3	May 23	May (mid.)	4
37	Chuck-will's-widow	Common	Fields and pastures	May 5	June 2	May (mid.)	10
38	Nighthawk	Common	Chimneys	May 15	June 17	May (late)	23
39	Chimney Swift	Common	Groves	May 9	May 14	May (early)	2
40	Ruby-throated Hummingbird	Common	Fields and pastures	May 10	June 13	May (late)	47
41	Kingbird	Common	Roadsides and edge of woods	Apr. 28	May 27	May (mid.)	23
42	Crested Flycatcher	Casual	Sparse woods	May 17	June 19	May (late)	11
43	Wood Pewee	Casual	Deep woods	May 4	June 19	May (late)	7
44	Green-crested Flycatcher	Common	Various	Mar. 29	June 5	April	149
45	Blue Jay	Common	Pine woods	Mar. 9	Apr. 22	Mar. (mid.)	42
46	American Crow	Common	Marshes and orchards	May 12	June 27	June (early)	118
47	Red-winged Blackbird	Common	Fields	Apr. 26	June 7	May (mid.)	29
48	Meadowlark	Common	Groves	May 4	June 8	May (mid.)	40
49	Orchard Oriole	Casual	Groves and fields	May 5	May 26	May (mid.)	23
50	Baltimore Oriole	Common	Marshes	May 3	June 6	May (mid.)	47
51	Purple Grackle	Casual	Marshes	—	—	—	14
52	Boat-tailed Grackle	Common	Various	—	—	Almost entire year	318+
53	English Sparrow	Casual	Pastures	May 7	June 10	May	19
54	Chipping Sparrow	Common	Fields	Apr. 14	May 21	Apr. (late)	32
55	Field Sparrow	Rare	Edge of wood	May 14	—	—	1
56	Hatchman's Sparrow	Casual	Thickets	May 6	June 6	May (mid.)	12
57	Towhee	Common	Various	Apr. 8	May 26	May (early)	93
58	Cardinal	Casual	Edge of woods	May 9	June 1	May	7
59	Blue Grosbeak						

No.	Species.	Occurrence	Nest-location.	Earliest date.	Latest date.	Maximum date.	No. of nests.
60	Indigo Bunting	Casual	Fields and woods	May 6	June 9	May (mid.)	9
61	Painted Bunting	Rare	_____	_____	_____	_____	—
62	Summer Tanager	Casual	Roadsides	Apr. 28	June 6	May (early)	23
63	Dickcissel	Casual	Hay fields	May 9	May 23	May (mid.)	16
64	Purple Martin	Common	Martin houses	May 2	May 23	May	51
65	Bank Swallow	Common	Cliffs and banks	Apr. 21	June 12	May	30
66	Loggerhead Shrike	Common	Pastures and orchards	Mar. 30	June 2	April	48
67	Red-eyed Vireo	Common	Woods	May 9	June 14	May (late)	19
68	Warbling Vireo	Rare	Woods	May 28	_____	_____	1
69	White-eyed Vireo	Common	Woods	May 10	May 29	May	13
70	Ovenbird	Rare	Wood edges	May 26	_____	_____	1
71	Maryland Yellow-throat	Common	Marshes	Apr. 28	May 26	May (early)	20
72	Yellow-breasted Chat	Casual	Wood edges	May 6	May 26	May	19
73	Mockingbird	Common	Various	Apr. 20	June 24	May (mid.)	135+
74	Catbird	Common	Thickets	May 2	June 17	May (late)	31
75	Brown Thrasher	Common	Thickets	Apr. 21	June 8	May (early)	81
76	Carolina Wren	Common	Various	Apr. 17	June 18	May (early)	59
77	Brown-headed Nuthatch	Casual	Pine deadenings	Mar. 17	Apr. 19	Apr. (early)	9
78	Tufted Titmouse	Casual	Near wood edges	Apr. 20	May 22	May (early)	11
79	Carolina Chickadee	Common	In fence posts	Mar. 30	May 2	Apr. (mid.)	18
80	Blue-gray Gnatcatcher	Rare	Groves	May 9	May 16	May (mid.)	2
81	Wood Thrush	Casual	Woods and groves	May 4	May 27	May (mid.)	15
82	American Robin	_____	_____	_____	_____	_____	—
83	Bluebird	Common	Various hollows	Mar. 29	June 3	Apr. (late)	89

WARBLER MIGRATION IN SOUTHEAST LOUISIANA
AND SOUTHERN MISSISSIPPI.

BY H. H. KOPMAN.

AS APPLIED to the conditions of bird migration in this vicinity, some of the deductions and generalizations made by Professor Cooke in his extremely interesting and instructive report on the 'Distribution and Migration of North American Warblers,'¹ give a slightly incorrect and incomplete view of the actual conditions of warbler migration in southeastern Louisiana and the middle Gulf coast of Mississippi. It should be said at the outset, however, that the records from which Professor Cooke drew, contributed by Andrew Allison and the writer, were circumscribed in many instances, owing to our imperfect opportunities for observation. It is not surprising, therefore, that in some cases our reports to the Biological Survey have failed to convey to Professor Cooke the real significance of the state of affairs to be exploited. The reports were in the nature, chiefly, of a series of categorical answers to categorical questions. It was unavoidable, therefore, that in many instances, the part of Professor Cooke's book relating to this locality and section should fail as to a precise definition of conditions.

Before taking up *ad seriatim* the species of warblers whose status in the above mentioned districts Professor Cooke has not made perfectly clear, I will touch upon two points of general application. The first concerns a mistake that would be made by anyone who had never visited this section of the country.

In the districts under consideration, there are two principal points from which we sent the reports that Professor Cooke used. One is Bay St. Louis, Miss., and the other is New Orleans. In many cases what might be said of a species at New Orleans would be true for that species at Bay St. Louis, for the latter point is only fifty miles east of New Orleans, and less than half a degree north. But on the other hand, assertions that fit some species at

¹ Bulletin No. 18, U. S. Department of Agriculture, Division of Biological Survey, 1904.

New Orleans are entirely inapplicable to the same birds as occurring in the piney country about Bay St. Louis. Species that arrive in numbers and with regularity at both places in spring and fall arrive at practically identical times, but there is a considerable number of birds which will be found in important numbers at one of these points at one season and not be found at the other. And this difference is of much more significance than might seem at first. New Orleans is on a rather low, alluvial plain, a country in large part swampy, with few characteristic tree growths except the water oak, the live oak, the tupelo gum, and the bald cypress. Bay St. Louis, on the other hand, is about fifteen miles east of the western limit of the piney belt in its coastward extension (the delta and immediate valley deposit of the Mississippi covering the lands about New Orleans that otherwise would be pine-bearing). Bay St. Louis, moreover, is on rather high ground, completely of white sand and red and yellow clay formations, and has a highly characteristic tree and shrub flora, of which the pines are most conspicuous. It can be seen, therefore, that many important distinctions in the avifauna are to be found when we compare the two districts. Some birds that migrate with regularity through the country about Bay St. Louis in spring, put in an appearance at New Orleans only occasionally, and *vice versa*. In the present instance, the trouble is that by far the larger part of the data have come from New Orleans, and the Bay St. Louis data, especially in regard to spring, have been used to supplement our reports for the New Orleans district. But the story of the migrations told us by the New Orleans records, is much more than supplemented, in many cases, by the observations made on the Mississippi coast. There are things brought out in the records from that district which we should never have discovered from the returns at New Orleans. In other words, the Bay St. Louis district is part of a distinct faunal area, and in its bearings to migration as well as to every other phase of bird-life, should be treated as such.¹

¹ Some of the differences between the avifauna of the fertile alluvial of southeast Louisiana and that of the pine districts to the north and east in Louisiana and Mississippi were pointed out by me in an article in 'The Gulf Fauna and Flora Bulletin,' Vol. I, No. 2.

The second point, and it is a matter upon which much difference of opinion might readily exist, concerns Professor Cooke's method of finding the average date of first arrival in spring. To add the number of days intervening each year between the first of the month in which the earliest record falls and the day of arrival for the year in question, and then to divide by the number of records, may be the best method to find the average date of arrival where the seasons are very consistent and regular; but in a region where there is occasionally a peculiarly abnormal year, the use of the record for such years vitiates the determination of the normal or typical time of arrival. Again, this is a matter that can be settled for any one region only by those who are on the ground all the time, and can use judgment in selection. The very late dates occasioned by late blizzards have been used by Professor Cooke in finding the average dates of arrival for this latitude. The records themselves do not in every case reflect the true state of affairs for certain seasons, because opportunities for observation in some of such years were limited, and the best date obtained was sent, though it might be known to be a late date. The necessary notes to that effect, it is true, were not appended in all cases. These circumstances aside, however, in this latitude at least, the average date of arrival in spring is the average of all records for normal seasons, though this statement applies better of course to the early part of the season, since a season rapidly catches up time once it has a good headway. It should be added that it would be as much of a mistake to include the date of arrival for one of our extremely forward springs as the date in a spring delayed by a blizzard. Including both extremes, one might expect to come reasonably near the practical rather than the ideal average, but in one case at least, that of the Hooded Warbler, Professor Cooke's method carries us considerably astray. The date upon which the Hooded Warbler appears most likely to arrive in a normal season is March 12. Professor Cooke, however, using the records available to him, determines the average date of arrival at New Orleans to be March 25. If one had a very full and trustworthy record, would not the best method, after all, be to settle upon that date which occurs most frequently? In the case of many species there would certainly be such a date.

This seems a more natural method than striking an ideal average date upon which the species may never have arrived!

1. BLACK-AND-WHITE WARBLER.—Professor Cooke calls attention to the lateness of the spring arrival of this species in southern Louisiana, where it is common only in fall. It is much commoner in spring at Bay St. Louis, and doubtless usually arrives there about March 20, the date on which Professor Cooke would expect to find it. We have but one complete spring record from Bay St. Louis; this is for the year 1902, and shows that the first Black-and-white Warbler came March 15, the next March 24, while the bulk of transients arrived April 10. The birds seen at New Orleans usually belong to the last designation, and that is the reason the arrival at New Orleans nearly always seems so much delayed, if it is detected at all. Professor Cooke thinks that the reason the Black-and-white Warbler usually delays its uncertain appearance at New Orleans is because the first migrants seek higher ground. The early arrival of the species on the coast of Mississippi shows, however, that this is only partly true; the difference in the character of the growth appears to explain the phenomenon, though, of course, this difference is partly associated with the altitude. Moreover, the Black-and-White Warbler was observed at New Orleans, Mar. 19 and 20, 1905.

2. PROTHONOTARY WARBLER.—Professor Cooke gives the average date of arrival at New Orleans as March 18. This is about as near the truth as one can come. It might be said that in normal seasons they would always be found by March 20, and not infrequently from one to three days earlier. In fact, there is a record of March 13, another of March 15, while twice the first has arrived March 19.

3. SWAINSON'S WARBLER.—Since the publication of Professor Cooke's book, we have established Louisiana records considerably earlier than any available to him when he was at work on his report. April 1, 1904, we heard about four in Jefferson Parish, opposite New Orleans, in a cane brake in thick, moist woodland where the species had been observed in April during several springs. On this occasion we took a specimen; several other specimens had been taken previously. It is not unlikely that the

birds seen April 1 had arrived with a general wave on March 30, and I observed the first, a single bird, on the latter date in 1905.

So far we have been unable to prove more than the fact that Swainson's Warbler is a regular transient in these woods, where we have seen it every spring we have looked for it since it was discovered there by A. B. Blakemore, April 11, 1896.

4. WORM-EATING WARBLER.—At New Orleans this species is decidedly rare, especially in spring. It is more common at points in the pinewoods north and east. Professor Cooke's quotations from our records apply chiefly to Covington and Bay St. Louis.

5. BACHMAN'S WARBLER.—In addition to the records cited, Andrew Allison saw one at Lobdell, West Baton Rouge Parish, La., May 9, 1903.

6. TENNESSEE WARBLER.—Our later records throw some little light upon the spring migration of this bird through southern Louisiana and Mississippi. In a small lot of warblers sent Andrew Allison, in the spring of 1902, from the lighthouse on Chandeleur Island, off the southeast coast of Louisiana, was a Tennessee Warbler that had struck the lighthouse April 13. While I had some dubious records of the occurrence of the Tennessee Warbler at New Orleans in the early part of April, it was not until 1903 that I saw the species, in spring, and then in some numbers, singing, and loitering to a degree that surprised me, for the first of these transients appeared April 26, and the last was noted May 9. They were restricted almost to one spot, a thicket of willows beside a pond in the suburbs of New Orleans. I observed others the latter part of April, 1905.

I once saw a specimen of a Tennessee Warbler that had been taken by H. W. Pring, in St. James Parish, fifty miles west of New Orleans, in March, but the exact date could not be supplied. The bird was killed probably about the 20th.

7. PARULA WARBLER.—It is deduced from the records furnished that the average date of arrival in spring is March 5, and the average time of first abundance is March 14. Practical experience here, however, suggests that the state of affairs would be slightly better indicated by approximating these two dates. One may always be fairly sure of seeing the first Parula at New Orleans March 7, while the species is usually abundant within three or four days.

8. **YELLOW WARBLER.**— There is undoubtedly a very restricted spring movement of this species, earlier than that which the majority of our records show. Dates of arrival as early as April 1 are rare, April 6, as Professor Cooke shows, being the average date when the first bird has been seen. However, in 1904, in the course of a twenty mile trip, March 30, I came across a single Yellow Warbler. Passing the same way the first of April, I found the bird still there. Ordinarily, one thinks to have done well in seeing this species at New Orleans or anywhere in that neighborhood, by April 3 or 4.¹

9. **BLACK-THROATED GREEN WARBLER.**— Professor Cooke is inclined to think that a specimen of this bird taken at Beauvoir, Miss., July 30, 1897, was an individual that had gone astray, and all the evidence of the fall migration of the species elsewhere supports his view. I am inclined to think, however, that parallel cases could be found, for while I positively recorded but one individual on the date mentioned, shooting that bird, which was an immature male, I saw several other birds that seemed to be of the same species. Furthermore, about July 23, 1896, in Madison Parish, northeastern Louisiana, I saw some birds that I feel well assured were Black-throated Green Warblers, but circumstances prevented a chance for either critical observation or identification by shooting. While the fall migration of the Black-throated Green Warbler appears to be much later, on the whole, than that of the Blackburnian, Bay-breasted, Cerulean, etc., I believe opportunities for further investigation of early migration on the Gulf coast might justify the belief that the Black-throated Green Warbler shares to a considerable extent in this early southward migration.

¹ It might be added here that what has been said of the Yellow Warbler applies to a large number of birds migrating through southeast Louisiana, or appearing there even as summer visitors. So often the first record of a bird, even after one has covered much territory, will be of a single individual, instead of the three or four, at least, that one might have expected to find. While this feature could hardly be called characteristic of this region, it is very noticeable, and because of it, a peculiar difficulty attaches to the collection of migration data here. It may be partly explained by the sameness of the country, so that the first arrivals are widely dispersed instead of being congested in some favorite localities.

10. PRAIRIE WARBLER.—Although the name of this species appears but a few times in our records, a fact noted by Professor Cooke, this was because it was observed only occasionally as an early migrant on the Mississippi coast, July 22, 1902, at Bay St. Louis, and July 28, 1897, at Beauvoir. Later in the summer, it has been seen on various occasions, and is by no means rare in the pine woods of southern Mississippi.

11. LOUISIANA WATER-THRUSH.—The records from this region available to Professor Cooke contained no instance of early arrival of this species in southern Louisiana, but March 19, 1904, I saw a single bird. This record makes it easier to understand the early arrival of the species at St. Louis, where Mr. Widmann has found it by March 29. Even so, our best date seems very late.

12. YELLOW-BREASTED CHAT.—While I was formerly inclined to agree with the opinion of Professor Beyer, quoted by Professor Cooke, that the Chat never reaches our district before the middle of April, having more recently seen the bird as early as April 11 (1903), I am inclined to think that in forward seasons at least, it is not so late a migrant as we had supposed.

13. HOODED WARBLER.—As before noted, the deductions made in regard to the arrival of the Hooded Warbler at New Orleans are considerably astray. March 12 is a normal time of arrival, and by March 25 it is nearly always abundant. The reason Professor Cooke has misunderstood the New Orleans records relating to this species is that some of them were for blizzard seasons, while others were made in seasons when opportunities for observation were limited. There is this, however, to be noted of the arrival of the Hooded Warbler in this section, that it comes much earlier at New Orleans and in identical country of southeast Louisiana, than at points in the pine woods or in some of the higher alluvial lands west of New Orleans, in other words, further up the river. This is no doubt because the species is so highly typical of the extremely low and wet alluvial lands of the southeastern corner of the State, and the legion breeding birds come to their stands there before the transients and smaller number of breeding birds have arrived at the higher lands. This is just the reverse of the case of the Black-and-white Warbler, for

the earliest birds of that species, transients in our latitude, pass hurriedly, and stop only in such kinds of country as most resemble their ultimate destination. In other words, as a general rule, their occurrence in the State in spring becomes extended from the higher lands to the lower as the season advances.

THE WINTER RANGES OF THE WARBLERS (MNIOTILTIDÆ).

BY W. W. COOKE.

MANY expert ornithologists have spent a great deal of time and care in working out the breeding range of each species of North American birds. No comparable effort has been bestowed on the question of the winter home, and as a result many loose statements are current in ornithological literature. There seems to be a tendency to consider any record south of the United States as a wintering record, whereas quite a number of species pass in migration through the West Indies or Central America to winter in South America.

The following tables show at a glance what part of the district south of the United States is occupied as a winter home and what is crossed in migration. It might be added that the charts are not designed to show anything with reference to the breeding range of any of these species; so that the statement, for instance, that *Protonotaria citrea* occurs in migration in the southeastern United States is not to be taken as indicating that it does not breed in that same district.

The tables are condensed from the Bulletin on the 'Distribution and Migration of North American Warblers' recently issued by the Biological Survey.

THE PURCHASE OF A GREAT AUK FOR THE THAYER MUSEUM AT LANCASTER, MASS.

BY JOHN E. THAYER.

(*Plates XIII and XIV.*)

THROUGH Mr. Rowland Ward of London I have had the good fortune to purchase a Great Auk (*Plautus impennis*) and three eggs. The following is an account of the bird and eggs.

MOUNTED BIRD.

This specimen was bought for Viscount Hill's Hawkstone collection in 1838 from Gould, the Naturalist, and was first mentioned by the late Mr. R. Champley of Scarborough in the 'Annals and Magazines of Natural History,' 1864, Vol. XIV, page 235. The Hawkstone collection was sold to Mr. Beville Stanier, who has a collection of birds of his District. A Great Auk not consistently belonging to a local collection, he decided to sell it and it was purchased through Rowland Ward of London for the Thayer Museum.

The following is taken from the Hawkstone catalogue,—“This Bird was re-set up by H. Shaw in 1867, and is supposed to be the best specimen in existence.”¹

THE THREE EGGS.

These eggs came from the collection of Mr. Robert Champley of Scarborough, England. He had nine Great Auk eggs, which were acquired by him in 1864 and a few years preceding that date.

Three of these came from the Royal College of Surgeons, London. Two of these eggs, No. 7 and 8, are the ones I bought. My other egg, Mr. Champley bought in Paris.

¹ It would be better to say “one of the best” instead of “best,” although it really is a magnificent specimen.



GREAT AUK *REGULUS IMPERIALIS*
In Collection of Hon. John E. Devereux, Esq., M.P.

In Symington Grieve's book, 'The Great Auk or Garefowl. Its History, Archæology and Remains,' there appears the following: "On the 11th of July, 1865, there was sold at Steven's Sale Rooms, London, four Great Auk eggs, that were part of the splendid set of ten eggs discovered in the Museum of the Royal College of Surgeons. The prices they fetched were 33£, 31£-38s, and two 29£ each." As it may be interesting for our readers to have some further information about these eggs, we may state, that in a footnote on page 483 of 'The Garefowl and its Historians' (Nat. Hist. Review, 1865), Professor A. Newton mentions that a few years prior to that time there was found in the Royal College of Surgeons, London, by the late Curator, Mr. Stewart, a box with the words, "Penguin Eggs — Dr. Dick." Of when or how they came into possession of the establishment there was no record.

The box contained ten matchless Great Auk eggs, which were recognized by Professor A. Newton, and from the name Penguin being on the box he supposed them to be of American origin.

The collection appears to have been unique and unrivalled, and to all interested in such remains invaluable for comparison. The authorities of the Royal Museum were evidently unappreciative of them, for it is stated that they disposed of some without even taking casts or photographs. From a letter which Mr. J. C. Stevens, the Auctioneer, wrote to Mr. Champley, dated 14th of July, 1865, we get the following information: Lot 140 sold for 29£, Lot 141 for 33£. Lot 142 for 31£-10s. Lot 143 for 29£.

In addition to the above four eggs of which we have given the sale prices, three others from the same collection were sold privately to Mr. Champley.

Egg No. 6 (Plate XIV, lower figure) was bought from Mr. Ward of London, who got it from Mr. Fairmaire, a dealer in Zoölogical wares in Paris. Mr. Ward sold it to Mr. Champley. Size $4\frac{7}{8}$ inches long, 3 inches broad. It has a ground color of dirty white, beautifully marked all over with black and brown spots. In Grieve's list of Great Auk's eggs this is No. 61 (see Grieve, page 33, appendix).

Egg No. 7 (not figured) was bought through the agency of Professor Flower from the Royal College of Surgeons by Mr.

Champley. Size $4\frac{3}{4}$ inches long and $3\frac{1}{4}$ broad. Dark yellow markings, all at the thick end (Grieve, No. 63, page 33, appendix).

Egg No. 8 (Plate XIV, upper figure) was bought from the same. Size $4\frac{3}{8}$ inches long and $2\frac{7}{8}$ broad. Ground color dark yellow, marked all over (Grieve, 65, page 34, appendix).

These eggs are all in good condition, but of course end blown and the holes seem large in comparison to the way eggs are blown to-day.

ORNITHOLOGY OF A CHURCHYARD.

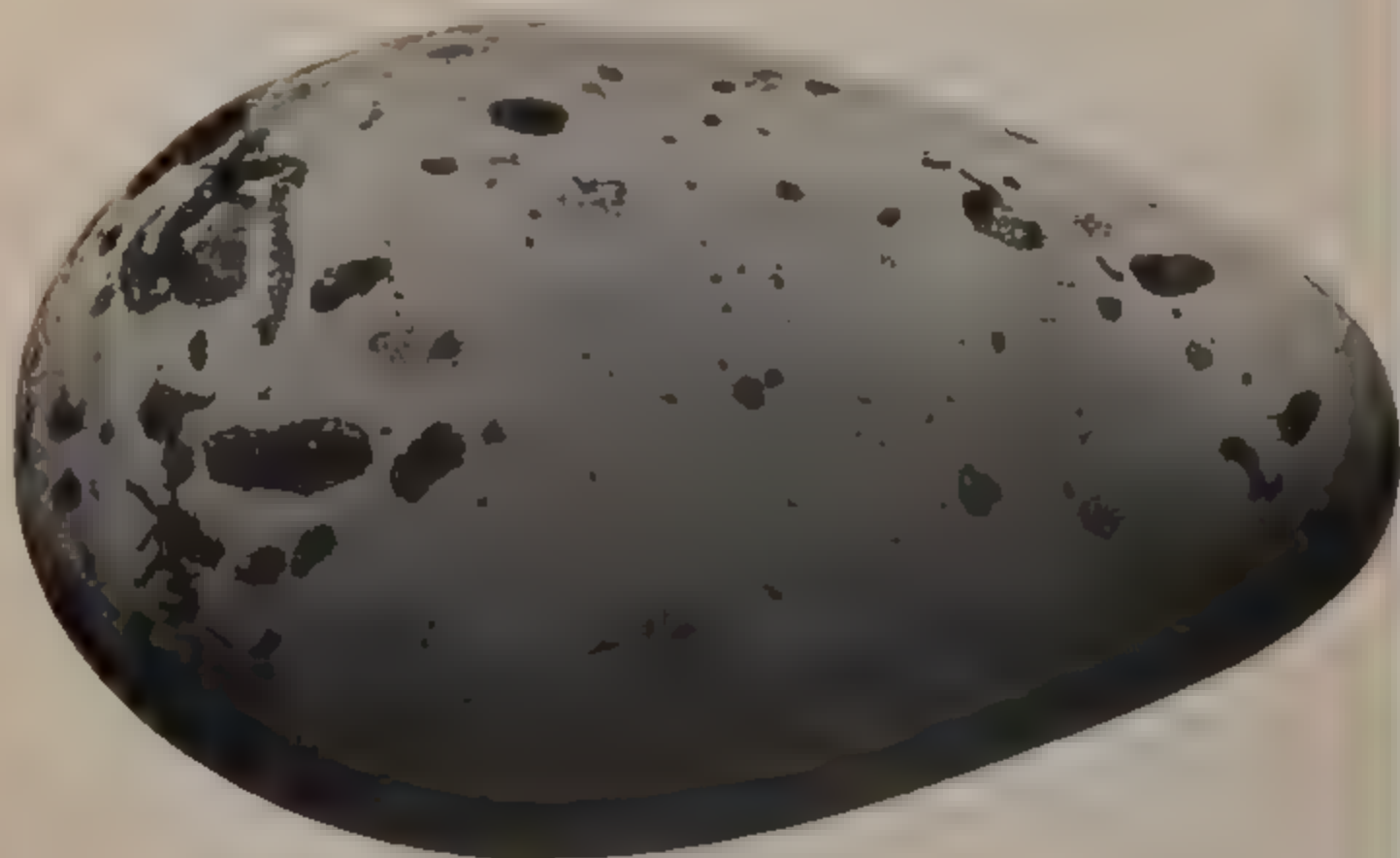
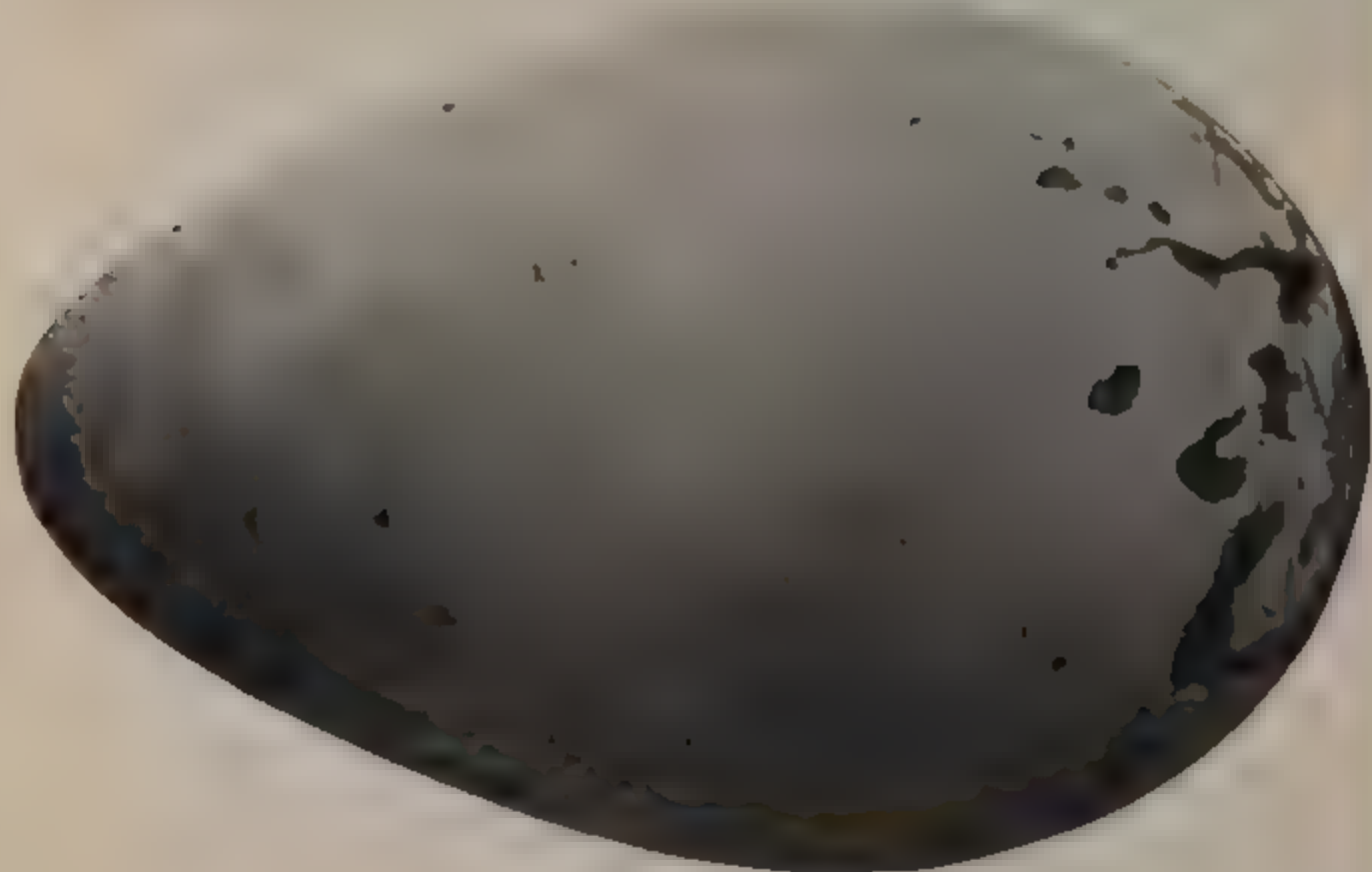
BY B. S. BOWDISH.

EVEN under unpromising conditions, and in unexpected places, there is often something for the bird-student to investigate. This is illustrated by some surprising records from city parks, and even from the smaller green spots, oases in the great desert of brick and mortar.

As such a record I here submit for whatever it may be worth, the results of observations in Saint Paul's Churchyard, New York City, made mostly during intervals of a few moments at noon, and occasionally in the morning, and covering the migration periods of spring and fall of 1903, and spring of 1904.

Saint Paul's Church property is situated nearly midway between the East and North Rivers, fronting east on Broadway, Church Street at the rear, Vesey Street on the north side and Fulton Street on the south, and it is thus in one of the busiest and noisiest sections of the city.

At the rear of the property, along Church Street, there is the constant rumble and roar of the elevated railroad. This church property is about 332 feet long by 177 feet wide, of which area the church occupies a space about 78 by 120 feet at the Broadway end, while at the Church Street end the Church School takes off another slice about 30 feet wide. The space remaining consists of the main yard at the rear of the church, between it and the



EGGS OF THE GREAT AUK
In Collection of Hon. John F. Thayer, Lancaster, Mass.

school, and a wing on either side of the church, each about 120 feet long by 48 feet wide. A narrow walk completes the circuit of the churchyard, about twenty feet from its outer edge. The grounds contain three large, ten medium, and forty smaller trees, not counting several that were being removed at the time of my count, and a number of shrubs and flowers, grass-plots and grass-grown graves. Even the most nerve-hardened native bird would hardly select such a spot for a summer home, nor attempt to take up winter quarters there.

Throughout the greater part of the summer and winter the noisy flock of English Sparrows domiciled here holds undisputed sway. It seems probable that the native birds that occur in the churchyard during migrations are such as are attracted to the green spot while passing in their flights directly over it, and that they are in no case stragglers from the temporary residents of the near-by country or parks. I have visited the churchyard many times in summer and winter, and during these periods between regular migratory seasons, I have yet to see or hear of the occurrence of a native bird. I have no spring record later than May, and no fall record after November, save the one of the Tree Sparrow, December 8, in which case it could not be fairly said that the season of migration was past.

From my data I am inclined to believe, too, that the bird movement of this very restricted area reflects, in a small way, that of the outside country. When the greatest number of birds was seen in the churchyard, it generally transpired that a bird-wave was on in the country just outside the city, which was also reflected in Central Park.

Misfortune is said to make strange bed-fellows, and certainly migration produces unexpected incongruities between birds and environment. Species whose sociability about the homes of man in the country would lead one to expect them to be among the first and most common to occur in the city parks and green spots, seem in many cases to be strangely wanting in the records for such places, while others of notably retiring habits, surprise one by their unexpected appearance in the crowded marts of civilization. The Woodcock has been recorded on the lawn of the American Museum of Natural History and in Trinity Churchyard, while

my Saint Paul's records of Song and Chipping Sparrows, Robin, Yellow Warbler, and some other of our more familiar birds are surprisingly few. According to the indications of the three seasons covered by my observations, the Yellow-bellied Sapsucker appears to be a regular visitor, which seems rather surprising.

Observations covering the period from the first to the last record were : for 1903, spring, 5 days, no birds ; 19 days, 18 species, 59 individuals : total, 24 days ; fall, 25 days, no birds ; 47 days, 26 species, 187 individuals : total 72 days. For 1904, spring, 7 days, no birds ; 24 days, 22 species, 87 individuals : total 31 days. Total for three seasons of observation : 37 days, no birds ; 90 days, 40 species, 328 individuals, 117 days observation. This gives an average of one bird in 2.25 days, and of 3.64 individuals per day of observation.

The list of birds noted is as follows :

Yellow-bellied Sapsucker, 5 records, — 1903, April 29, 1 ; Sept. 25, 1 ; Oct. 12, 2 ; Oct. 22, 1 ; 1904, April 6, 1 ; total, 6.

Red-bellied Woodpecker, 1 record, — Oct. 1, 1903, 1.

Phœbe, 3 records, — 1903, Sept. 12, 1 ; Sept. 25, 1 ; Oct. 15, 1 ; total, 3.

Least Flycatcher, 5 records, — 1903, May 19, 3 ; May 22, 1 ; Sept. 24, 1 ; Sept. 25, 1 ; 1904, May 13, 1 ; total, 7.

White-crowned Sparrow, 2 records, — 1904, April 25, 2 ; April 26, 2 ; total, 4 (probably only two birds).

White-throated Sparrow, 16 records, — 1903, May 1, 1 ; May 16, 1 ; May 18, 1 ; May 20, 1 ; May 26, 1 ; May 28, 1 ; Sept. 24, 1 ; Sept. 26, 1 ; Sept. 30, 1 ; Oct. 19, 2 ; Oct. 23, 1 ; Oct. 24, 1 ; 1904, April 25, 2 ; April 26, 3 ; May 10, 1 ; May 11, 1 ; total, 19.

Tree Sparrow, 1 record, — Dec. 8, 1903, 1.

Chipping Sparrow, 6 records, — 1903, May 11, 1 ; 1904, April 18, 2 ; May 3, 1 ; May 9, 1 ; May 11, 1 ; May 12, 1 ; total, 7.

Field Sparrow, 5 records, — 1903, Oct. 8, 1 ; 1904, April 18, 1 ; April 28, 1 ; April 29, 1 ; May 2, 1 ; total, 5.

Slate-colored Junco, 24 records, — 1903, April 29, 1 ; Sept. 26, 1 ; Sept. 29, 2 ; Sept. 30, 3 ; Oct. 2, 1 ; Oct. 3, 1 ; Oct. 12, 1 ; Oct. 13, 1 ; Oct. 14, 1 ; Oct. 22, 3 ; Oct. 23, 1 ; Oct. 24, 1 ; Oct. 26, 3 ; Oct. 27, 2 ; Oct. 28, 2 ; Oct. 29, 6 ; Oct. 30, 1 ; Oct. 31, 5 ; Nov. 2, 1 ; Nov. 5, 1 ; Nov. 6, 1 ; Nov. 10, 1 ; Nov. 16, 1 ; 1904, April 30, 1 ; total, 45.

Song Sparrow, 1 record, — April 30, 1904, 1.

Towhee, 7 records, — 1903, May 1, male ; May 6, male ; May 7, female ; Oct. 3, female ; 1904, May 5, female ; May 10, 2 females ; May 13, male ; May 16, female ; total, 9.

Indigo Bunting, 1 record, — May 12, 1904, bright male.

- Scarlet Tanager, 1 record,— May 14, 1904, male.
- Red-eyed Vireo, 2 records,— 1904, May 12, 1 ; May 13, 1 ; total, 2.
- Blue-winged Warbler, 2 records,— 1903, Sept. 8, 1 ; Sept. 25, 1 ; total, 2.
- Parula Warbler, 1 record,— May 5, 1904, 1.
- Yellow Warbler, 3 records,— 1903, May 19, 1 ; May 22, 1 ; Sept. 4, 1 ; total, 3.
- Black-throated Blue Warbler, 1 record,— Oct. 22, 1903, 1.
- Myrtle Warbler, 1 record,— Oct. 13, 1904, 1.
- Magnolia Warbler, 1 record,— May 20, 1903, 1.
- Palm Warbler, 1 record,— Oct. 13, 1903, 1.
- Ovenbird, 11 records,— 1903, May 15, 1 ; May 16, 2 ; May 18, 2 ; May 19, 2 ; Sept. 1, 1 ; 1904, Apr. 25, 1 ; Apr. 26, 1 ; May 5, 1 ; May 16, 1 ; May 17, 1 ; May 18, 1 ; total, 14.
- Water Thrush, 1 record,— May 19, 1903, 1.
- Northern Yellow-throat, 7 records,— 1903, May 14, 1 ; May 22, 1 ; Oct. 12, 1 ; 1904, May 11, 1 ; May 20, 2 ; May 21, 1 ; May 24, 2 ; total, 9.
- Canadian Warbler, 1 record,— May 21, 1903, 1.
- American Redstart, 5 records,— 1903, May 19, 1 ; Sept. 1, 2 ; Sept. 3, 1 ; Sept. 4, 1 ; 1904, May 20, 1 ; total, 6.
- Catbird, 10 records.— 1903, May 9, 1 ; May 15, 1 ; May 18, 1 ; May 20, 1 ; Sept. 29, 1 ; 1904, May 5, 1 ; May 7, 2 ; May 12, 1 ; May 13, 1 ; May 20, 1 ; total, 11.
- Brown Thrasher, 14 records,— 1903, May 4, 1 ; May 15, 1 ; May 16, 1 ; May 18, 1 ; May 20, 3 ; May 22, 2 ; May 23, 1 ; May 26, 1 ; May 27, 2 ; Sept. 30, 1 ; Oct. 3, 1 ; 1904, May 5, 2 ; May 16, 1 ; May 24, 1 ; total, 19.
- Winter Wren, 1 record.— Oct. 28, 1904, 1.
- Brown Creeper, 1 record,— Oct. 12, 1903, 1.
- Red-breasted Nuthatch, 3 records,— 1903, Sept. 1, 1 ; Sept. 8, 1 ; Sept. 24, 1 ; total, 3.
- Chickadee, 14 records,— 1903, Sept. 15, 3 ; Sept. 21, 3 ; Sept. 25, 7 ; Sept. 29, 2 ; Sept. 30, 2 ; Oct. 1, 4 ; Oct. 6, 2 ; Oct. 7, 2 ; Oct. 10, 1 ; Oct. 12, 2 ; Oct. 16, 3 ; Oct. 19, 1 ; Oct. 30, 1 ; total, 33.
- Golden-crowned Kinglet, 3 records,— 1903, Oct. 21, 1 ; Oct. 29, 1 ; Oct. 31, 1 ; total, 3.
- Ruby-crowned Kinglet, 5 records,— 1903, Oct. 13, 2 ; Oct. 14, 3 ; Oct. 21, 2 ; Oct. 23, 1 ; Oct. 24, 1 ; total, 9.
- Wood Thrush, 2 records,— 1903, Oct. 14, 1 ; 1904, May 17, 1 ; total, 2.
- Wilson's Thrush, 5 records,— 1903, May 19, 1 ; 1904, May 12, 2 ; May 17, 1 ; May 20, 1 ; May 24, 2 ; total, 7.
- Olive-backed Thrush, 13 records.— 1903, May 22, 2 ; May 27, 1 ; Sept. 8, 2 ; Sept. 9, 1 ; Sept. 29, 2 ; Sept. 30, 1 ; Oct. 1, 1 ; Oct. 14, 1 ; 1904, May 11, 1 ; May 12, 1 ; May 13, 1 ; May 18, 1 ; May 20, 1 ; total, 16.
- Hermit Thrush, 32 records,— 1903, April 29, 6 ; May 4, 1 ; Sept. 30, 2 ; Oct. 6, 1 ; Oct. 12, 2 ; Oct. 13, 2 ; Oct. 14, 8 ; Oct. 15, 4 ; Oct. 16, 1 ; Oct. 21, 1 ; Oct. 23, 3 ; Oct. 24, 2 ; Oct. 26, 2 ; Oct. 27, 4 ; Oct. 28, 2 ; Oct. 29, 2 ; Oct. 30, 2 ; Oct. 31, 4 ; Nov. 2, 1 ; Nov. 4, 3 ; Nov. 5, 1 ; Nov. 9, 1 ;

Nov. 10, 1; Nov. 11, 1; Nov. 16, 1; Nov. 23, 2; Nov. 24, 2; 1904, April 25, 8; April 26, 2; April 30, 2; total, 79.

American Robin, 2 records,—1903, Oct. 21, 1; Oct. 22, 1; total, 2.

Bluebird, 1 record,—Nov. 6, 1903, 2.

In the record above given, where a species occurred on consecutive dates, doubtless in some cases the same individual remained two or more days. In one instance, at least, this was certainly the case. A Hermit Thrush, one of four noted October 15, 1903, had a bar of light yellowish on the left wing. This bird was again noted on the 16th, the only one seen on the latter date. In the majority of cases, however, such records probably represent different individuals, and as far as I am able to judge, the birds make but a brief stop in the churchyard. In some cases the birds noted in the morning were gone by noon, and others not noted in the morning had appeared.

Truly Saint Paul's Churchyard seems to be for many migrant birds an oasis in a desert of brick and mortar, a spot where tired and hungry individuals may drop down to rest and feed, and incidentally to gladden the eye and quicken the pulse of the city-confined nature lover.

A Robin (young of the year) noted August 30, will perhaps necessitate the modification of the statement regarding absence of birds during summer, though it is quite possible that this individual had begun a migratory movement.

With the exception of the Robin above referred to, the first migrant (a Water-Thrush) was not noted until Sept. 13, and the indications of the churchyard evidence were that the fall migration was either begun late, or that the earlier migration was hurriedly performed, with few stops.

THE CUBAN CRAB HAWK, *URUBITINGA GUNDLACHII* (CABANIS).

BY OUTRAM BANGS.

THE Crab Hawk or Black Hawk of Cuba was described by Cabanis in 1854 and named *Hypomorphnus gundlachii*.¹ Since then authors have sometimes given it by that name, but have more often referred it to the continental *Urubitinga anthracina* (Licht.), it appearing thus in 'Catalogue of Birds in British Museum,' Vol. I, and in Sharpe's 'Hand-List of Birds.'

Gundlach was of course familiar with the bird, but probably never had an opportunity of comparing it with *U. anthracina*, and in his 'Ornitología Cubana' (Habana, 1893) gives the following account of the Cuban species, pages 18 and 19.

"Genus *Urubitinga* (Lesson).

"6. *Urubitinga anthracina* (Falco anthracina Licht). Batista and in the Isle of Pines it is called *Copete*.

"This species has on p. 40 of my Contributions the name of *Hypomorphnus Gundlachi*, Cabanis, but as this name is later than that of Lichtenstein I place it in the synonymy. It is also found in the Isle of Pines, in Jamaica, in Guadaloupe, and in Grenada, and probably in other of the Lesser Antilles, besides Central America and Mexico.

Apparently it is found only in mangrove swamps and on the banks of large rivers. Its note resembles its common name *batista-ta*. I have killed a few, both adults and young.

"Dimensions are adult male, length 488-520, extent 1226-1232. Of the female, length 566-610, extent 1367-1418 mm.

"I found in the stomach remains of crustaceans. Other naturalists have found in the stomachs frogs, snakes, and fishes, but no one has found remains of birds. It is then a species which is neither useful nor harmful.

¹J. f. O., 1854, extra page, *lxxx*.

"In the Isle of Pines I found a nest in a Júcaro (*Avicennia*), constructed of twigs like nests of other hawks. The egg was dirty white with a greenish tinge. At the larger end there were some very pale lilac spots. The dimensions were 58×45 mm.

"Its flight is rapid, rather in a straight line and not in circles."¹

Specimens of *U. gundlachii* are singularly rare in collections, so much so, that it is very doubtful if any American ornithologist has ever seen one. Cory speaks of the bird as though he had never seen a skin, and I know Ridgway never saw it. I was therefore delighted when my friend, John E. Thayer, Esq., presented me with a fine adult male, shot at its nest, together with the female, in Cayo Romano, Puerto Principe, Cuba, April 15, 1905, by Harry A. Cash.

I at once saw Mr. Cash and got him to tell me all he knew of the species, with which he had become very familiar during a short collecting trip, made in an open boat among the Cays of the north coast of Puerto Principe, in April and March last. Mr. Cash says that the 'Batista' is a common bird in this region, but that it appears to be entirely confined to the vicinity of the coast — the mangrove swamps and shores of the salt lagoons and rivers — and that he did not see it far inland.

At that time of year the birds were in pairs, and each pair seemed to hold undisputed possession of three or four miles of coast in the neighborhood of its nest. About ten pairs in all were seen.

My bird, a male, was killed at its nest April 15, and next day the female was shot and one fresh egg taken from the nest. The female contained another egg, soft-shelled and without markings, but nearly full size.

The nest was about twenty feet from the ground in a small 'hobo' tree, standing at the edge of a salt lagoon two miles from the sea. It was in appearance much like an Osprey's, evidently used year after year, the lower twigs showing signs of age and

¹ This translation was kindly made for me by Capt. Wirt Robinson, U. S. A.

I have omitted Gundlach's description because it is long and detailed and when translated into English not particularly clear.

decay. The twigs used in the construction of the nest were very large, and there was no lining of soft material or feathers, and no feathers were found on the bushes in the vicinity of the nest.

The egg which Mr. Cash has kindly given me is rounded ovate in shape. The ground color is dirty bluish white, and it is irregularly covered with small blotches and dots of pale, dilute chestnut, a few little dots here and there being strong chestnut; these markings rather more numerous at the larger end. It measures, 56 by 45.5 mm.

Mr. Cash shot, in all, three adult birds but unfortunately two of them spoiled; he informs me they were all practically alike.

The Cuban Crab Hawk is a very distinct species, and of course should be known as *Urubitinga gundlachii* (Cabanis). It differs from all other members of the genus in the body color, in the fully adult plumage, being rich chocolate brown, *not black*, the tail and primaries only being blackish. It differs also in many details from *U. anthracina* with which it has been confused, but to which, I should say, it bears only a distant relationship. The more marked of these are, that the lining of the wing is much purer and more extensively white; the two lower white bands on the tail (usually indicated by a few white spots in *U. anthracina*) are broader and more pronounced and the dusky band separating the broad central white band from the next lower one is very narrow. It is of about the size of, or a trifle larger than, *U. anthracina*, with a decidedly heavier, broader bill.¹ My skin, no. 15242, adult ♂, measures: wing, 365; tail, 206; tarsus, 92; culmen, 38.5 mm.

The Cuban species differs much from the Crab Hawk of St. Vincent, lately described by Austin H. Clark as *Urubitinga anthracina cancrivora*,² not only in color and other characters, but in habits. The St. Vincent *Urubitinga* is a bird of the high mountain forest, while *U. gundlachii* appears to be wholly confined to the mangrove-fringed sea coasts and cays.

¹ Most of these characters were dwelt upon at length by Cabanis in his original description of the species.

² Preliminary Descriptions of Three New Birds from St. Vincent, West Indies. Proc. Biol. Soc. of Washington, Vol. XVIII, p. 63, Feb. 21, 1905.

GENERAL NOTES.

The Dovekie on the Coast of North Carolina.—I wish to record the capture of a male Dovekie (*Alle alle*) January 20, 1905, on the beach of the Currituck Shooting Club, N. C., half a mile south of the Life Saving Station. The bird was picked up alive. It only lived a day. It was sent to me in the flesh by a member of the Club and is now in my collection. —JOHN E. THAYER, *Lancaster, Mass.*

The Golden Eagle (*Aquila chrysaetos*) near Ottawa.—A bird of the year of this species was given to me, which had been caught in a trap set for otter or muskrats near High Falls, Wright Co., Quebec, forty miles northeast of Ottawa. It measured 77 inches from tip to tip. This species has not been reported from this vicinity for years. The Bald Eagle is a little more frequent.—C. W. G. EIFRIG, *Ottawa, Ont.*

The Genus *Conurus* in the West Indies.—The distribution of the genus *Conurus* in the West Indies is worthy of notice. In the Greater Antilles it is found on Jamaica, Cuba, Haiti, Porto Rico, and St. Thomas. It was formerly found (*C. euops*) on the Isle of Pines, but there are no records of its occurrence on islands other than those mentioned, although *Amazona* is found on Grand Cayman and in the Bahamas. All the species to which we have reference in literature have survived to the present day. One extra-limital species of parrakeet, *Brologerys tui*, has been credited to these islands, the mistake apparently having been first made in the Planches Enluménées (No. 456, fig. 1, "La Petite Perruche de l'Isle St. Thomas" = *B. tui*). In the Lesser Antilles parrakeets are now everywhere extinct, but we have good evidence that they formerly existed on Guadeloupe, Dominica, Martinique, and Barbados. Here, as in the Greater Antilles, their distribution was apparently erratic; Barbados, with no other genus of Psittacidae, corresponds to St. Thomas, while St. Lucia and St. Vincent, each with an *Amazona*, resemble Grand Cayman and the Bahamas. It is difficult to understand why some of the other islands, such as St. Kitts, Nevis, Antigua, St. Vincent, and Grenada, but more especially Tobago and Trinidad, have never, so far as known, had as a resident any species of *Conurus*.

The parrakeet, unfortunately, appears to have been too small to attract the attention of the earlier writers, and we therefore find the references brief and unsatisfactory. Dutertre (Hist. gén. des Isles des Christophe, de la Guadeloupe, etc., p. 299, 1654; Hist. gén. des Antilles habitées par les François, II, p. 251, 1667), de Rochefort (Hist. nat. et morale des Isles Antilles, p. 157, 1658; p. 175, 1665), and Labat (Nouv. voyage aux Isles de l'Amérique, II, p. 218, 1742) all mention them and give good accounts of their habits and characteristics, but in no case give enough description to enable us to identify the species to which the birds belonged. The

parrakeet of Guadeloupe is said to have been the smallest of the Antillean species, and to have been green throughout except for some small red feathers in the head, with a white beak, and about the size of a thrush (Labat).

Brisson (Orn., IV, p. 330, 1760) under "La Perruche de la Guadeloupe" says: "Size of a half grown chicken, green throughout; naked skin about eye, white; iris red; cere white; beak, feet, and claws, white. Found in Brazil and Guadeloupe." This description was probably founded on that of Labat, and is unfortunately applicable to more than one species, although, perhaps, it may best be referred to *Conurus euops*. It cannot have been taken from a Cuban bird, however, as Labat was for many years a resident in these islands, and was well aware that the avifauna of any one differs markedly from that of any of the others.

Under the name of "La Perruche de la Martinique," Brisson (*t. c.*, p. 356) gives a description of a bird which covers perfectly the well-known *Conurus æruginosus* of the mainland, referring to Edwards (Birds IV, pl. 177, p. 177, 1751) for a figure of the species. It is on this plate and description that Linnæus's [*Psittacus*] *æruginosus* (Syst. Nat., I, p. 142, No. 17, 1766) is founded. Brisson says that this bird is found in Martinique, and also in various places on the mainland, while Edwards gives for it the rather vague habitat of "West Indies." Very likely this is a case of a continental species wrongly credited to the Antilles (comparable to that of *Brologerys lui*); but we have no evidence to show that this is the case, and it is not at all improbable that the *Conurus* of Martinique was a brown-throated species, similar to *C. æruginosus*.

There appears to be no description extant of the species which formerly inhabited Dominica; but it seems to have been exterminated at an early date. Ober's remarks (quoted by Lawrence, Proc. U. S. Nat. Mus., I, p. 64, 1878) doubtless had reference to *Amazona bouqueti*, and not to any species of *Conurus*.

Hughes, in his 'Natural History of Barbados' (1750) under "The Parakite" (p. 73) says: "This is of the frugivorous kind, and about the bigness of a thrush, having a longer and more crooked bill. It feeds on all manner of berries, popaws, and ripe plantains, residing chiefly in inaccessible gullies. The bird borrows its name from its resemblance in make, but not in plumage, to the small green parakite." Sir Robert Schomburgk (Hist. Barbados, p. 681, 1848) includes "*Psittacus passerinus*" in his list of the birds of the island, but no parrakeet is mentioned by Ligon.

In summing up the above it will be seen that, while there appears to be ample evidence for admitting the genus *Conurus* into the avifauna of the Lesser Antilles as formerly resident on Guadeloupe, Dominica, Martinique, and Barbados, all that we can say respecting the species is that the one on Guadeloupe was the smallest (of those on the French islands), and resembled *C. euops* of Cuba. Whether the Lesser Antillean birds were colonies of continental species (comparable to the case of *Ceryle torquata* [sticti-

pennis], *Antrostomus rufus*, or *Urubitinga anthracina* [*cancrivora*]), whether they were seasonal visitants (as *C. æruginosus* appears to be on Margarita Island, and *Muscivora tyrannus* is on Trinidad, Tobago, Grenada, and the southern Grenadines), or whether they were distinct endemic species we cannot determine, nor can we judge from the other genera of Psittacidæ, *Ara* and *Amazona*, inhabiting these islands; for *Conurus* is more restless in its habits, and more apt to cross wide stretches of water than the species belonging to these genera, and we have one West Indian species (*C. pertinax*) which has a peculiarly interrupted range (St. Thomas and Curaçao), a circumstance not known to occur in any species of *Ara* or *Amazona*.—AUSTIN H. CLARK, *Boston, Mass.*

Nesting of the Raven (*Corvus corax principalis*) at Cumberland, Md.—In my list of birds of western Maryland (Auk, XXI, 1904, p. 234) I mentioned, besides a large permanent colony six miles from the city, a very noisy pair that I had seen on Will's Mountain, right at the city limits. When on a visit to this my former home last summer, I was informed by my former assistants that a pair of Ravens had nested that spring in the 'Narrows.' This is a highly romantic and picturesque cañon in Will's Mountain which otherwise runs on unbroken for many miles, and forms the only outlet from Cumberland to the north, so that several railroads and street car lines pass through at the bottom. I found the boy, a very intelligent lad of fifteen, who had discovered and investigated the nest and taken the young ones along. He stated this to me, corroborated by others: The nest was in a well nigh inaccessible place on the side of the cliff overlooking the Baltimore and Ohio Railroad. It was built of large sticks, some horsehair, rags, and in the middle much of the shredded rag put by railroaders in the axle-boxes of railway cars. He went to the nest March 28 for the first time and found three nearly full grown young; he thinks they must have been a month old. He took two along, with the intention of raising them. The old ones were very vicious, flew close to him, as though wanting to strike at him, and made a great uproar. April 4 he got the remaining one, which also showed fight, even for a while in captivity. The first two died after several weeks, being exhibited in show windows, etc., but the third one was still alive August 2, when I saw it. It seemed to be then somewhat attached to its master and upon his word would come out of the woodshed, if no strangers were about. The old ravens remained at the Narrows; I saw and heard them July 20, but they made no further attempts that year at raising a brood. They evidently must have lost a good deal of their fear of man, for the upper edge of these cliffs is almost daily visited by sightseers.—C. W. G. EIFRIG, *Ottawa, Ont.*

A One-legged Crow (*Corvus brachyrhynchos*).—On May 6 of last year, while out in the woods with a friend, he shot a crow out of a tall, slender

spruce tree. When we picked it up, we were astonished to find one foot entirely missing, and it certainly was not a mutilation that had lately occurred, for the end of the stump of the tarsus was completely healed and well worn, as though it had always been in this condition. About an inch of the tarsus was there. It was a male bird, in good plumage and condition; the stomach was filled with food, mostly earth worms. We were afterwards told by a person living near by, that he had observed a crow the previous summer that had a very queer way of hopping about on the fields while feeding. — C. W. G. EIFRIG, *Ottawa, Ont.*

An Unusual Abundance of the Canada Jay (*Perisoreus canadensis*) in and near Ottawa, Ont. — Whereas the winter from 1903 to 1904 was notable for the abundance of the Pine Grosbeak (*Pinicolor enucleator*) in the streets of Ottawa, their early arrival and long staying, this last winter was notable for the abundance of the Canada Jay. Mr. E. White, a very reliable ornithologist, tells me he has never before seen them in or very near the city, but this year they were about all winter. I saw the first ones September 28 in the next county, but by October 7 they were near Ottawa; on October 13 I saw three on the driveway in the heart of the city. Some were taken and brought or reported to me on October 15, 20, 22, 28, November 8 and 12. November 19 to 23, while on a trip of forty miles north into Quebec, I saw them frequently, especially where farmers had butchered or skinned hares, at the kitchen refuse, etc. One was taken February 2 at the city limits, and I saw one March 1 in the neighborhood. The reason for their unusual abundance is not clear. Their usual food supply, which I think is not great in any winter, was surely there last winter, the lumber camps, about which they congregate, not having diminished in number. — C. W. G. EIFRIG, *Ottawa, Ont.*

Hoary Redpoll in Montana.—I am able to record another occurrence of the Hoary Redpoll (*Acanthis hornemannii exilipes*) in Montana. On March 9, a Hoary Redpoll alighted with two common Redpolls (*Acanthis linaria*), on some rails close to where my wife and I were standing. I had my binoculars with me but they were not required, as the bird was only eight paces distant and could be easily examined. While exactly the same size as its two companions it was much handsomer; the crimson crown contrasted with the light-colored back, which, but for some black streaks, would have looked white. There were no signs of pink on the breast, and I took it to be an unusually pale female of this species. As I never before met with a specimen among the many hundreds of Redpolls observed since 1889, I regard the Hoary Redpoll as a very rare bird here.—E. S. CAMERON, *Terry, Mont.*

A curious Anomaly in the White-throated Sparrow (*Zonotrichia albicollis*).—On Sept. 28, 1904, I took at Germanicus, Renfrew Co.,

Ontario, a male bird of this species, that showed a strange freak in the tail. While all the other feathers are of normal length and development (2.50 in. long), one shows a length of 3.75 in. It is of the same color as the other tail feathers, but the vanes are narrower. Near the ends of the other rectrices it is much attenuated, as though it had wanted to stop growing at that point. It is the only instance of this kind that has come under my observation.—C. W. G. EIFRIG, *Ottawa, Ont.*

The Migrant Shrike (*Lanius ludovicianus migrans*) at Ottawa, Ont.—This shrike is a common breeder here. In 1904 I saw the first ones, a pair, on April 5, and this year on March 30. They frequent wet meadows, old fields, etc. By the middle of April they are common. The last one in 1904 I saw August 23, when I was attracted to a hedge by the low but pretty singing of a bird, which proved to be the shrike. The song was much like the subdued song of the Catbird, with much of its sweetness. Although those that I took had beetles only in their stomachs, yet on April 26, 1904, I saw a pair that had a Song Sparrow impaled on a thorn and had eaten off the head. May 10 I found the first nest in the usual thorn-thicket in a moist meadow, containing two eggs. May 21, I found another nest at Casselman, thirty miles east of Ottawa; this was eight feet up in a little wild plum tree and contained five young about a day old and one infertile egg. The female, in both cases, would only fly away when the person was within a few feet of the nest, and would sit near by and utter queer rasping or gurgling notes of protest.—C. W. G. EIFRIG, *Ottawa, Ont.*

Capture of the Kirtland Warbler near Richmond, Ind.—On May 13, 1905, a female Kirtland Warbler (*Dendroica kirtlandi*) was shot about six miles east of here by Mr. Loren C. Petry. It was silent, perfectly fearless, and showed the 'teetering' habit after the manner of a Palm Warbler or Titlark. It was in a clump of low bushes.—D. W. DENNIS, *Richmond, Ind.*

The Kentucky Warbler at Winneconne, Wisconsin.—On May 7, 1905, I had the pleasure of finding a Kentucky Warbler (*Oporornis formosa*) in a damp corner of the woods near Lake Winneconne. I observed it for ten or fifteen minutes from a distance of only a few feet, and am thus positive of the identification.

The Kumlien-Hollister List of Wisconsin Birds (1903) says of this species: "Dr. Hoy took one specimen at Racine (May 10, 1851) and we have but six other records for the State for 60 years, all about Lake Koshkonong, in spring."—HENRY P. SEVERSON, *Winneconne, Wisc.*

Wintering of the Brown Thrasher in a Park in New York City.—A Brown Thrasher (*Toxostoma rufum*) passed the winter of 1904-05 in Morningside Park, New York City. I first saw him on Oct. 24, 1904,

and subsequently on twenty-three different occasions. He would apparently disappear from the park for short intervals, once for a period of two weeks, as I was on the watch for him and visited the park almost daily without seeing him. On December 19 he came to me for the first time for peanuts, and after that always came to my hand freely and without fear. On May 10, 1905, I saw a female of the same species with him, and also several other Brown Thrashers. As this was the last time I saw him, he probably accompanied the other Brown Thrashers when they left the park.— LILLIAN W. LEWIS, *New York City*.

An addition to the Avifauna of Cuba.— On October 16, 1903, at the Morro Castle, Santiago, Cuba, I took a specimen of *Saxicola ænanthe leucorhoa* (Gmel.). It was a female in good condition. It was feeding in the scanty grass in company with a large straggling flock of Palm Warblers.— WIRT ROBINSON, *Capt. U. S. A., Ft. Totten, N. Y.*

Note on *Lagopus leucurus* and *Leucosticte australis*.— In Volume V, Zoölogy of the Wheeler Survey, published in 1875, mention is made of two specimens of *Leucosticte australis* collected by C. E. Aiken on Mount Blanco, New Mexico, Sept. 3, 1874, with the remark that "this is perhaps near the limit of its southward range."

On page 439 of the same volume are recorded six specimens of *Lagopus leucurus* collected by Aiken on Mount Blaine, Colorado, Sept. 3, 1874. As the two localities are several hundred miles apart, and as the specimens of the two species are recorded as having been collected on the same day by the same collector (who, moreover, never visited Mount Blanco), it is evident that the records involve a mistake. Inquiry discloses the fact that they involve two mistakes.

A letter recently at hand from Mr. Aiken states that the specimens of both *Leucosticte* and *Lagopus* were secured by him on the mountain in southern Colorado known upon present maps as "Summit Peak." At the time of his visit, however, no name for the peak was known to Mr. Aiken, but he was informed that it was to receive the name of Mount Blaine. Hence the name of the latter in the record of the ptarmigan and on the labels of the specimens. The name Mount Blaine was not bestowed by the Wheeler Survey upon the "Summit Peak," but subsequently was given to a high mountain in Ouray County which appears on the Hayden and other maps as Mount Sneffels. How the specimens of *L. australis* came to be wrongly labeled Mount Blanco, New Mexico, and so recorded in the volume above mentioned, will probably never be known; nor does it much matter.

It is important that Summit Peak be recorded as the true locality of Aiken's specimens of *Leucosticte australis* and *Lagopus leucurus*, since the latter have been taken as the types of *Lagopus leucurus altipetens* (Auk, XVIII, p. 180, 1901) and credited to Mount Blaine; while there is

no record to show that *Leucosticte australis* has ever been taken in New Mexico, Summit Peak, southern Colorado being at present its southern recorded limit. — H. W. HENSHAW, *Washington, D. C.*

Notes from Northern New Mexico. — The present status of *Lagopus l. altipetens* in the southern Rocky Mountains has been one of the interesting questions of our Biological Survey bird work in New Mexico. In the summer of 1903 we obtained old records of a few Ptarmigan seen in Mora Pass and on the peaks above the Upper Pecos, and in the winter of 1904 a specimen was collected in the Taos Mountains above Twining, about thirty miles south of the Colorado line, this being the first skin to substantiate the New Mexico records.¹ On July 19, 1904, we entered the mountains at Twining and proceeded to work the highest parts of the range between Taos and the Colorado line. The crest of the range between Taos and Twining runs far above timberline, by our aneroid readings averaging about 13,000 feet, with Taos as a base station at 7,000 feet. The highest point, known locally as Wheeler Peak, averaged with five readings 13,700 feet, which would make it the highest peak in New Mexico. In this group of mountains, although most of the snow melts in summer, Ptarmigan evidently were common before the advent of miners and sheep men. Our Indian camp man told us that twenty years before he had seen 'whole-lot-ta,' and now the birds are still common enough to be familiarly known by the Indians who see a few every year. At the time of our visit, however, large bands of sheep were running over the crest of the range, and although our party made six different trips to the peaks, only four Ptarmigan were seen. Two of these were secured by Sun-Elk, our Indian, who found them among the peaks above 13,000 feet, where he had seen them in previous years. Three primaries that he discovered on the trail followed by the sheep men suggested the probability that the sheep scared up the birds and the herders killed them with stones. Large bands of sheep were running over the crest of Costilla Peak just south of the Colorado line when we reached there on August 20. On the peak at 13,200 and 13,300 feet by the barometer, Mr. Bailey found evidence of Ptarmigan in piles of winter sign, considerable accumulations being found in some places. Two Mexicans he met on the mountain reported killing four of the birds that day, and a hunter from the neighborhood spoke of them familiarly. He generally found them in small flocks, he said, but sometimes saw as many as fifty together. He called them snowbirds, saying that they were usually found sitting around on the little benches near a large snowbank on the northeast side of the peak at about 13,200 feet. He added that the birds were very tame and that the males called in the mornings like a hawk. While only three

¹ Additional Notes on the Birds of the Upper Pecos. *The Auk*, 1904, pp. 351, 352.

specimens of *altipetens* have actually been collected from the New Mexico Rockies, such evidence gathered from hunters, Indians, and cattle men, shows conclusively not only that the birds were once common in the northern mountains of the territory, but that, although their numbers have been greatly depleted, Ptarmigan are still to be found by careful search on the highest peaks of New Mexico.

Ptarmigan and *Leucosticte australis* were the two birds we were most anxious to find in the high Rockies, and on July 20, the first day that we climbed Wheeler Peak we were following up the crest of the ridge at about 13,500 feet by the barometer, when a bird flew overhead whose call, undulating flight, and emarginate tail proclaimed it a *Leucosticte*, but hunt as we would we could get no other sight of it or its companions. A week later, however, on July 28, while Mr. Bailey was crossing an adjoining peak, he again heard the chirping of *Leucosticte*, this time in a cloud below him. When he answered the call a flock of about half a dozen came flying out of the cloud and lit on the stones four or five rods from him. An adult male that lit in sight was secured but the rest scattered among the stones and at the shot disappeared again in the clouds. Two days later Sun-Elk got another adult male near the same place, possibly from the same flock. These birds were both in full adult plumage with the characteristic black bills of the breeding season. The question that arose was, were they birds that had bred on these mountains, or were they from a band that had wandered down from Colorado after the breeding season? The mountains were about thirty miles from the Colorado line and judging from Mr. Cooke's accounts of the habits of the birds they do not wander much from their breeding grounds. He states, moreover, that the height of the breeding season is the latter part of July, and our first bird was seen July 20, the flocks being seen on July 28 and July 30. In August, as Mr. Cooke says, "Young and old swarm over the summits of the peaks, picking insects off the snow. By the last of October or early in November they descend to timberline and remain there through the winter except as they are driven a little lower by the severest storms. At the same time a few come into the lower valleys almost to the base of the foothills."¹ Nothing seems to be known of any southward wanderings. It would seem probable, therefore, that the Wheeler Peak birds furnish a breeding record for New Mexico. But however that may be, the only other records of *Leucosticte australis* from New Mexico are those of two birds taken by Mr. C. E. H. Aiken, reported in the Wheeler Survey, and, as Mr. Henshaw explains above (see p. 315), it now proves that these birds came, not from New Mexico, but from Colorado. The Wheeler Peak specimens therefore afford the first authentic record for New Mexico.

Another addition to the New Mexico list, presumably also a breeding record, is that of *Hylocichla f. salvicola*, for we heard one of these

¹ The Birds of Colorado, State Agr. Coll. Bull. No. 37, p. 98.

thrushes singing on July 17, 1904, in the willows bordering Pueblo Creek, just beyond the Pueblo of Taos. As the birds are 'not uncommon' in Colorado, it would not be strange to find them in suitable localities thirty miles south of the borderline.

Skins of male and female *Galeoscoptes carolinensis* had previously been sent in from Rinconada under date of June 4, 1904, and we found Catbirds fairly common in the thickets bordering Pueblo Creek the second week in July. One was seen carrying food on July 15. On July 14, as we drove along the road our attention was attracted by the cries of a pair of Catbirds in the adjoining thicket, and when Mr. Bailey forced his way through the tangle he found the nest empty except for one headless nestling whose murder the old birds were bewailing.

Dendroica caerulescens, while migrating only 'casually to the east base of the Rocky Mountains,' had previously been recorded from the Rio Mimbres and Rio Grande in New Mexico, and on October 8, 1904, Mr. Bailey took one in the Gallinas Mountains, near the middle of Rio Arriba County. The bird, which was shot from a high conifer in a gulch, proved to be a male in first fall plumage.—FLORENCE MERRIAM BAILEY, *Washington, D. C.*

The former Status of the Flamingo and the Fish Hawk in the Lesser Antilles.—In the writings of Dutertre (*Histoire générale des Isles des Christophe, de la Guadeloupe, de la Martinique, et autres dans l'Amérique*, 1654, p. 300; *Hist. gén. des Antilles habitées par les François*, II, 1667, p. 268) we find the Flamingo (flambant; flaman; flamand) mentioned as occurring at that time in Guadeloupe. He says, regarding this bird: "Rare, and only seen in the 'salines' farthest away from habitations. The young are more white than the adults, but become redder with age." Although no definite locality is given, Guadeloupe is probably meant (the other islands considered being St. Kitts, Dominica, Martinique, and Grenada), as the author resided there, and in all cases where an animal or bird described does not occur on that island (as for instance the armadillo, 1667, p. 298, of Grenada) he gives its habitat. Moreover, the zoölogical notes are largely confined to the fauna of Guadeloupe. This is also, I believe, the first mention of the lighter (less red) plumage of the young bird.

Mr. Francis Coull (at present residing at Grenada) tells me that formerly Flamingos were of casual occurrence at Antigua, and he once saw several in the Five Island swamps, about forty years ago. He has not heard of them on the island since that time, although they were then well known to many of the natives under the name "Flamingo." There is no mistaking Mr. Coull's identification, and the locality is very favorable for the birds.

At Anegada, the most northerly of the Virgin Islands, where the conditions are much like those in the Bahamas, I am informed by a resident that they are still of casual occurrence. Dr. Christian Branch of St.

Kitts formerly magistrate at Inagua, Bahamas, who knows Anegada well, assures me that this is true.

The Lesser Antillean range of *Phænicopterus ruber*, then, should be, formerly south to Guadeloupe; until about 1860 casual on Antigua, now casual at Anegada, and apparently unknown south of that island.

The Fish Hawk (*Pandion haliaëtus carolinensis*) is not now known to breed in the Lesser Antilles, although of common occurrence throughout the islands in fall and winter and sometimes seen in summer. The following account by Dutertre regarding this bird in Guadeloupe is therefore of interest (1667, II, p. 253). "The children of the natives (Caribs) train the young (fish-hawks) and make use of them for fishing, but only for sport, as they never bring back the fish."—AUSTIN H. CLARK, *Boston, Mass.*

Two Massachusetts Records.—Mr. John E. Thayer permits me to record the following captures, the specimens referred to being now in his museum at Lancaster, Mass. On May 24, 1904, a boy caught a female Purple Gallinule (*Ionornis martinica*) at Randolph. The bird was kept alive for a few days, but finally died, and was purchased by Mr. Thayer. On August 12, 1904, Mr. Henry W. Abbott shot a female Little Blue Heron (*Florida cærulea*) at Sandwich. The specimen is almost white, being in the light phase of plumage.—REGINALD HEBER HOWE, JR., *Concord, Mass.*

Notes on Nebraska Birds.—Since the publication of the 'Birds of Nebraska' last summer some new records have been established which may prove to be of more than local interest, and these are given below.

Anas obscura rubripes. RED-LEGGED BLACK DUCK.—Until recently we had no definite record of this duck in the State. A typical male specimen of this subspecies was received at the University which had been shot on the Platte River near Greenwood on March 15, 1905. A subsequent examination of all other specimens accessible showed another male taken at Lincoln November 16, 1896, by Mr. August Eiche, to be referable to this form, although not quite typical of it. A female taken at Calhoun and now in the collection of J. E. Wallace at Omaha was distinctly *rubripes*, and was in a flock from which at the same time two males of undoubted *obscura* were taken. Additional records of *obscura* were determined in a female from Fairmont and a male from Gresham.

Herodias egretta. AMERICAN EGRET.—The sixth record of this fine bird for the State is based on a specimen shot at Nehawka, May 2, 1905, and sent to the University for determination and mounting. It has been retained in the University collection. The record of the "Snowy Heron" from Fairbury, as recorded in our list, really refers to this species, and forms the fifth definite record of its occurrence.

Phalaropus lobatus. NORTHERN PHALAROPE.—Our previous conception of the Northern Phalarope as a "rare" migrant has not been at all

borne out this year. On August 23 and September 18, 1904, and on May 14, 1905, this bird was present in large flocks at the lake west of Lincoln. The same observation applies to the Bed-backed Sandpiper and the Buff-breasted Sandpiper, the former having been noted very commonly on May 22, August 23, September 4 and 11, 1904, and on May 14, 1905, while the latter was present in great numbers on September 11 and 18, 1904, being the most evident sandpiper on the lake.

Falco sparverius phalaena. WESTERN SPARROW HAWK.—I have recently examined two male Sparrow Hawks, one taken at Florence and one at Lincoln, in the collections of Messrs. Wallace and Eiche respectively, and both are as clearly *phalaena* as is our specimen from Sioux county. Very like'y it is not rare as a migrant over the entire State.

Tyrannus verticalis. ARKANSAS KINGBIRD.—This flycatcher, while abundant enough in the western part of the State, has, until the last two years, always been considered a rarity in eastern Nebraska where it occurs as a migrant. In fact, single records of its occurrence at Omaha, Lincoln, and West Point practically constituted the list of eastern records until last year when four additional records were established. During the past month of May, 1905, it has been reported frequently, and in some localities as common, one Omaha observer having seen twelve in one day. Personally I have seen it at Dunbar on May 6, at Lincoln on May 14, and at South Bend on May 17. There would seem to be considerable foundation for a belief that the species is extending its line of migration eastward.

Ammodramus henslowii occidentalis. WESTERN HENSLOW'S SPARROW.—A third record for this bird is one taken at Dunbar, April 30, 1904, by Mr. E. H. Jones of that place.

Vireo philadelphicus. PHILADELPHIA VIREO.—A pair of this vireo was observed under the binoculars for nearly an hour by the writer and others at Dunbar on May 16, 1905.—MYRON H. SWENK, *Dept. Entomology and Ornithology, University of Nebraska, Lincoln, Neb.*

Do Migrants Fast?—There has been an impression among some who have examined the stomachs of birds or who have speculated upon the various problems in connection with migration that many migrants make an effort to rid themselves of all food contents before beginning the flight. From the evidence of the examined stomachs alone, this opinion is the natural one, since they have been found in nearly every case to be perfectly empty, only rarely containing an amount of food equal to one per cent of the stomach capacity. Of more than one hundred stomachs of migrants examined by the writer, not more than five had a trace of food in them.

Recently opportunity was afforded to examine the entire viscera of many birds (mostly warblers) killed by striking the Washington Monument on the night of May 6-7, 1905. For the preservation of this material I am indebted to Prof. W. W. Cooke. With one exception the

stomachs were empty, but in a majority of the specimens, the *intestine*, including even the *duodenum*, was as well filled with food material as in a migrant warbler shot in the evening after feeding all day. This proves, at least for the species examined, that the birds do not make any special preparation for the migration flight in regard to the amount of food they carry. This is the rational supposition and is supported by the observed fact that birds are seen busily feeding on evenings which as shown by subsequent events are just prior to migration. The empty condition of the *stomachs* of birds killed in migration is easily explained by the rapidity with which the digestive process is usually accomplished in birds. — W. L. MCATEE, *Washington, D. C.*

Hybridism between the Shoveller and Blue-winged Teal.—I have recently examined a very interesting hybrid, and the first I have heard of between these two species. Mr. James P. Catlin of Ottawa, Ill., in whose possession the duck is, writes me as follows: "It is an entirely new cross to me and was shot by the keeper of the Greenwing Gun Club on their preserve along the Illinois River at Bureau Junction, Ill., on April 3, 1905. He had a few decoys set out in a small opening in the flooded timber and this bird came in with a Blue-winged Teal hen. He killed the pair."

The specimen is a male about half way in size between the two species. The head shows the greenish reflections of the Shoveller, the spotted breast of the Teal, the chestnut abdomen, the speculum and under tail coverts of the Shoveller, and the upper wing-coverts of the Teal; the crescentic patch across the anterior portion of the head is normal for the Teal but not as pure white in color; the legs and feet have the bright yellow of the Teal. The bill is .65 in. longer than in a normal Teal, but is a miniature of that of the Shoveller in other ways.

Every specimen of hybrid duck which has come to my notice has been a male. The cross between the Mallard and Pintail is not uncommon; the last record was a specimen sent to me in the flesh by Mr. Charles M. Carter, shot at Bigelow, Mo., Feb. 25, 1905. Mr. Manly Hardy of Brewer, Me., has in his collection two examples of crosses between the Mallard and Dusky Duck, one favoring the plumage of the former, the other of the latter, one example each between the Gadwall and Widgeon, and the Blue-winged and Cinnamon Teal. — RUTHVEN DEANE, *Chicago, Ill.*

RECENT LITERATURE.

Townsend's 'The Birds of Essex County, Massachusetts.'¹ — This is by far the most elaborate treatise on the birds of so limited a district that has yet appeared in this country, it forming a neatly printed quarto volume of over three hundred and fifty pages. It is published as a memoir of the Nuttall Ornithological Club of Cambridge, and its thoroughness of research and literary execution does credit alike to the Club and the author. The introductory matter, comprising some seventy pages, is divided into nine chapters, following which is Chapter X, 'Annotated List of the Birds of Essex County' (pp. 74-321), a bibliography of ten pages, and an excellent index.

The introductory matter comprises nine chapters, as follows: (1) 'Topography and Faunal Areas' (pp. 6-11), which includes an account of the geographical boundaries, the topography, especially in its relation to glacial agencies, the principal botanical features, and the faunal affiliations of the district; (2) 'The Ocean and its Birds' (pp. 12-17), which treats informally of the manner and season of occurrence of the various species of water fowl that frequent the seacoast; (3) 'The Sand Beaches and their Birds' (pp. 18-29), in which various other beach inhabitants, as fishes mollusks, crustaceans, etc., come in for incidental mention, mainly as furnishing food for the birds. The characteristic birds of a sandy seabeach are, primarily of course, the Limicolæ, but Gulls and Terns, Ducks and Herons, are found among those that leave their 'footprints on the sands,' while many passerine birds also visit the beach for food. The interest of the seabeach to the ornithologist, at all seasons, in winter as well as in summer, is dwelt on at length, and the incidents of personal observation here set down afford proof not only of this claim, but of the author's familiarity with the varied forms of life of the beach under the ever varying conditions due to the passing of the seasons. (4) 'The Sand Dunes and their Birds' (pp. 30-44). The sand dunes of the Ipswich and other beaches of Essex County are well worthy of the special chapter devoted to them; the constantly changing forms of the dunes, due to the action of the winds, and their peculiar vegetation, as well as the birds that visit them, — in winter for food, in summer for nesting places, — conspire to give them special interest. It was here that the first specimens of the Ipswich Sparrow were taken — by C. J. Maynard in 1868. (5) 'The Salt Marshes and their Birds' (pp. 36-42), and (6) 'The Fresh Marshes and their Birds' (pp. 43-48), which furnish each their peculiar environment

¹ Memoirs of the Nuttall Ornithological Club. | No. III. | The Birds of Essex County, | Massachusetts. | By Charles Wendell Townsend, M. D. | — | With one plate and map. | — | Cambridge, Mass. | Published by the Club. | April, 1905. — 4to, pp. 352, frontispiece and map.

and assemblages of birds, are minutely described; several pages are also given to "some actual records of the various bird-voices" heard during the hours of night in the Fresh Marshes. (7) 'The Ponds and their Birds' (pp. 49-52) are similarly treated; a list of the water-fowl killed by gunners in Wenham Lake for the five years 1900-1904 forms part of the chapter. (8) 'Lighthouse Records' (pp. 53-59). Apparently few birds strike any of the nine lighthouses of Essex County. (9) 'Ornithological History of Essex County' (pp. 60-73). This is naturally one of the most interesting chapters of the book. The records of such early writers as Morrell (1623), Higginson (1630), Wood (1634) Morton (1637), and Josselyn (1675) are cited (although not here for the first time exploited) in evidence of the former much greater abundance of water-fowl and sundry other species. As is well known, the Great Auk was formerly a bird of the Massachusetts coast, though probably not within historic times; but the case is quite different with the Labrador Duck, the Wild Turkey, the Heath Hen, the Sandhill Crane, and the Wild Pigeon, all of which in earlier days were among the common birds of the region, while many others formerly common but now known merely as accidental stragglers have become practically extirpated. The history of the extirpation of several of these species is summarized. The author adds his own valuable observations on the changes in the bird life of Essex County during the last twenty-eight years; some species of water-fowl and shore birds have declined in numbers, while others appear to hold their own; hawks are growing scarcer, and the English Sparrow has greatly reduced the number of box-breeding birds.

The 'Annotated List,' forming of course the chief part of the volume, is admirably done. The points of chief interest are always explicitly stated, and the biographical observations are, in the case of a few species, extended to considerable length. Authorities are fully cited for the occurrence of the rarer species, and a number of species formerly attributed to the county are excluded on the ground that the evidence of their capture within the limits of the list is unsatisfactory. They are, however, together with species of probable occurrence, mentioned, in smaller type, in their proper places, with appropriate comment. The list of indigenous species and subspecies authenticated as birds of Essex County numbers 319; there are in addition 6 extirpated and 2 extinct species, making a total of 327, besides 2 introduced species. Sixteen are given as of doubtful record, 2 as of erroneous record, and one as mythical, making the total number of species considered, 254. The bibliography occupies pp. 322-331, and includes about 150 entries.

As already said, the work is marked by careful research, is well executed and in every way creditable to the author and the publishers, the Nuttall Club. The quotations from the seventeenth century historians of the region, which serve as mottoes for the chapters, are not only appropriate but impart a pleasing literary quaintness to this portion of the work.—J. A. A.

Job's 'Wild Wings.'¹— Mr. Job needs no introduction to ornithologists nor to the general public, either as a 'camera-hunter' or a field student of birds. To say, therefore, that the present work will add both to his prestige and to our knowledge of the larger wild birds of North America is no light commendation of his latest contribution to popular ornithology. 'Wild Wings' consists of four parts, each with a number of chapters according to the character of the subject matter. Part I is entitled 'Adventurings in Florida Waters,' and contains five chapters, as follows: (1) 'Cities of the Brown Pelicans' (Pelican Island, east coast of Florida); (2) 'Following Audubon among the Florida Keys' (contrasting present conditions with those witnessed by Audubon in 1832); (3) 'In the Cape Sable Wilderness'; (4) 'The Great Cuthbert Rookery' (the scene of the Cuthbert massacre of Egrets about 1890 revisited, with photographs from life of Wood and White Ibises, Cormorants, Anhingas, and Herons); (5) 'On Lonely Bird Key' (Bird Key, with Audubon reminiscences and present conditions). Part II, 'Other Wanderings South,' contains: (6) 'Scavengers of the South' (Turkey Buzzards and Black Vultures); (7) 'Virginia Bird Homes on Beach and Marsh' (the summer bird-life of Cobb's Island); (8) 'The Egret, in Nature and Fashion' (Egrets in life, with a résumé of the results and revolting barbarities of the millinery trade in aigrettes). Part III, 'The Sea, The Sea,' contains: (9) 'To Bird Rock in an open Boat' (Bird Rock in the Gulf of St. Lawrence and its sea-bird rookeries); (10) 'Amid Spruces and Sea-girt Islands' (southeastern Nova Scotia and adjacent islands); (11) 'Off Chatham Bars' (with the sea-birds off Cape Cod, Mass.). Part IV, 'The Elusive Shore-Birds,' contains: (12) 'The Shore Patrol' (Plovers and Sandpipers); (13) 'Northward with the Shore-Bird Host' (experiences on the Magdalen Islands and coast of Labrador); (14) 'Shore-Bird Loiterers' (chiefly about Turnstones, Wilson's Plovers and Willets). Part V, 'Raptors and Forest Fastnesses,' has: (15) 'The New Sport of "Hawking"' (with the camera—nests and eggs of various species of hawks); (16) 'Owl Secrets' (their nesting habits); (17) 'Adventures with Great Horned Owls.'

The above synopsis of the contents of 'Wild Wings' leaves little to add, except to say that the author's enthusiasm, endurance of hardship, and perseverance, added to skill with the camera and experience in wood-

¹ Wild Wings | Adventures of a Camera-Hunter among the larger | Wild Birds of North America on Sea and Land | By | Herbert Keightley Job | Author of "Among the Water-fowl," | Member of the American Ornithologists' Union, etc. | With an Introductory Letter | by Theodore Roosevelt | With one hundred and sixty illustrations after photographs from life | by the Author | Houghton Mifflin & Company | Boston and New York | The Riverside Press Cambridge — Svo, pp. xxviii + 342, 160 half-tone cuts and plates, illustrated titlepage. \$3.00 net. Published May, 1905.

craft, have enabled him to bring together a most wonderfully interesting and instructive series of pictures of wild birds in life, illustrating the nesting habits, poses, and manner of flight of a large number of species, some of which have not heretofore been so successfully and fully portrayed by the camera. The scenes visited include not only many portions of the Atlantic coast from the Florida Keys to Labrador, but many points in the interior. The accompanying text is always pertinent, and full of first-hand information, rendering the book of permanent value as a record of bird-life. The publishers have done their share in making the book attractive in its general make-up, and in the care evidently bestowed upon the reproduction and printing of the illustrations.—J. A. A.

Sharpe on the Birds of the Antarctic Regions.¹—Naturally the list of species here treated is not large, numbering only 25, and consists wholly of Water Birds, of which 3 are Penguins (Sphenisciformes), 17 are Procellariiformes, 4 are Lariformes, with a single species of Cormorant (Pelecaniformes). Nearly half of the text and nearly all of the text illustrations relate to the Adelia Penguin (*Pygoscelis adeliæ*), of which there are two colored plates, representing the adult, the young, and the eggs. Under each species is given first its synonymy and other bibliographical references, with a list of the specimens brought home by the expedition, followed by appropriate biographical matter. Much of this is compiled from the reports of previous Antarctic expeditions, thus bringing together practically all that is known of the life-histories of the species treated. Many extracts are made from the private diary of the late Nicolai Hanson, the naturalist of the 'Southern Cross' Expedition, who died before the conclusion of the voyage.² The fourteen half-tone illustrations, from photographs of the Adelia Penguin rookeries, of the birds singly and in groups, in various attitudes and under diverse conditions, afford a most welcome contribution to the life-history of this exceedingly interesting species.—J. A. A.

Butterfield on Bird Migration.—In a recent paper entitled 'Remarks upon some theories in regard to the Migration of Birds,'³ Mr. J. Ruskin

¹ Report on the Collections of Natural History made in the Antarctic Regions during the Voyage of the "Southern Cross." 8vo, London, 1902. Published by order of the Trustees of the British Museum (Natural History). IV. Aves. By R. Bowdler Sharpe, L. L. D., F. R. S., etc. Pp. 106–173, pll. (col.) vii–x, and numerous half-tone illustrations.

² This diary, translated from the Norwegian language by his father, Anton Hanson, forms Part III (pp. 79–105) of the Report on the Collections of the 'Southern Cross,' and is a most valuable contribution to the natural history results of the Expedition.

³ Remarks upon some Theories in regard to the Migration of Birds. By W. Ruskin Butterfield. *Novitates Zoologicæ*, Vol. XII, pp. 15–20, Jan., 1905.

Butterfield comments briefly, considering the breadth of the subject, on a few of the many theories respecting the origin, manner, and causes of the migration of birds. His criticisms are mainly destructive rather than constructive, and he offers us little in the way of a clear and sharp formulary of even his own views on the several points discussed. His remarks are grouped under the subheadings (1) 'Incentives to Migration,' (2) 'Migration Routes,' (3) 'How do Birds find their Way?' and (4) 'Origin of Bird Migration.'

Taking the last topic first, the author seems to accept, in a general way, the hypothesis that "the changes of climate induced in the northern hemisphere by the decline of the Glacial Period as the ultimate cause of migration in this part of the globe"; although, under present conditions, "the migratory impulse tends to strengthen in some forms and to weaken in others." He cites the case of the varying degrees of migration presented by different forms of the Horned Larks; but almost any widely dispersed group of closely related birds offer equally pertinent illustrations of this rather obvious condition.

Under 'Incentives to Migration' he believes that too much stress has been laid upon "scarcity of food" as the impelling cause of the autumn migration, inasmuch as in species of wide latitudinal dispersion, the places of individuals that live in the middle districts are taken, for a time, later in the season, by individuals of the same species from further north. "While admitting," he says, "that want of sustenance may prompt the autumn migration in some cases, it may be doubted whether it is so important a factor as is generally supposed." He believes that the completion of the moult and (in adults) "the decline of the stimulus of reproduction" are also factors. The first is undoubtedly an important one in the case of certain groups of birds, as the Anserine series and some others, which suffer simultaneous loss of the wing-quills during moult and are thus for a time almost flightless, and it doubtless affects others less effectually crippled by the annual moult. It is also true that many migratory species of birds lead a less sedentary life after the close of the breeding season, and in many cases become wanderers, quite deserting their immediate breeding grounds, and in some cases even depart for more southern latitudes long before the decline in either temperature or (apparently) the food supply would necessitate such a movement. Yet, sooner or later, migration from these causes would become compulsory, and while under present conditions few migratory species wait for a crisis from such conditions before moving from their breeding stations, it is hardly to be doubted that far back in the history of bird migration they were the impelling factors. They may even still be accounted as the primary cause, and that for reasons not at present quite clear to us many species anticipate the ultimate necessity by a movement somewhat in advance of compulsory conditions, they being free to roam at large as soon as the restraining duties of reproduction are fully past.

Regarding the incentive to the spring migration, Mr. Butterfield hardly

makes his opinions clear. While apparently not discarding the idea that the spring movement is incited by the periodic activity of the reproductive organs, he seems hardly to adopt it; and cites the "demonstrations" of Cooke and Clarke of "the importance of temperature as a factor," only to say that "the remarkable uniformity of climatic conditions prevailing in the Tropics makes it clear that we must look elsewhere for an explanation of the departure of migratory species which winter in this zone."

That the incentive is primarily physiological seems more and more to be confirmed with the advance of our knowledge of the manner and conditions of the movement. That temperature is a powerful regulating factor as regards the rapidity of the journey after the birds are under way, the researches of Cooke and others may be considered as having unquestionably demonstrated. That warm and cold changes in the weather respectively accelerate or retard the northward bound birds in their spring journey is at least one fact in bird migration that is not open to question.

Respecting the impulse to migrate in spring, the following from a paper on the 'Origin of Bird Migration' by Mr. F. M. Chapman, published some ten years ago (*Auk*, XI, Jan. 1894, pp. 12-17), may well be recalled in this connection: "Many animals," he says, "have an instinctive desire for seclusion during the season of reproduction Many species of tropical sea-birds resort each year to some rocky islet, situated perhaps in the heart of their habitat, where they may nest in safety. This is not migration in the true sense of the word, but nevertheless the object is the same as that which prompts the Plover to migrate to the Arctic regions, and, be it further noted, the movement is just as regular. These sea-birds pass their lives in the tropics, their presence or absence in any part of their range being largely dependent upon the food supply. But, as in the case of a Warbler which nests in Labrador, they are all affected at nearly the same time by an impulse which urges them to hasten to a certain place. This impulse is periodic and is common to all birds It is evident, therefore, that external conditions have not created this impulse, though it is possible that in many instances they may have governed its periodicity. On the contrary, its causes are internal. In the case of the sea-birds, for example, dissection will show an enlargement of the sexual organs and it is this physiological change which warns the birds that the season of reproduction is at hand."

Under 'Migration Routes,' and 'How do Birds find their Way?' the author's remarks presents little that calls for comment, being for the most part a brief reference to more or less generally accepted views. He is inclined, however, to combat the idea that birds either follow, or are guided in their journeys by, physical features. He says: "Where physical features are followed, we may be sure it is not from the guidance they afford, but because they mark out convenient highways." This assertion appears to be based on what "the Swallow" does in England; from which he concludes: "In the great masses of land, the guidance afforded

by following rivers or mountain ranges would, as often as not, lead birds right out of their course." In the first place, the conditions furnished by a small island like England are far from those that characterize a large continent, like Europe-Asia or North America. In the second place, we are unable to recall where it has been alleged that birds follow, in their long migratory journeys, either mountain ranges or large streams. Our author says: "There is some indubitable evidence that migration at times proceeds at great heights." The claim is, so far as we are aware, that birds passing at these great heights are able to see the leading features of the landscape beneath them, and that, presuming birds to have memory, they may be thus guided by the principal physical features of the country over which they are passing, and thus follow or cross mountain ranges or river valleys or coast lines as their route may require.

Just how, or by what means, birds find their way our author fails to tell us, though he admits belief that "birds possess a sense of direction," for how else could Albatrosses and other pelagic birds find their way back, at the proper season, to their breeding stations; in other words, he says: "The faculty whereby they direct their flight back to their breeding stations, over hundreds [sometimes thousands] of miles of open water, is doubtless akin to that exhibited by savages and pigeons." There is doubtless a problem here man will strive long to fathom before reaching a wholly satisfactory solution, but the suggestion made by Mr. Austin H. Clark in the April (1905) issue of this Journal (*Auk*, XXII, pp. 134-140), that the prevailing winds of certain latitudes, especially the trade-winds, may be an important aid, particularly in the case of pelagic wanderers, seems at least worthy of serious consideration.—J. A. A.

Riley's 'Birds of the Bahama Islands.'¹—In this paper is given a carefully prepared summary of our present knowledge of the ornithology of the Bahama Islands, consisting of a list of the 204 species and subspecies known to occur there, and notes on their relative abundance and manner of occurrence, preceded by a résumé of ornithological explorations in the archipelago, and by eight pages on 'The Zoögeographical Position of the Bahama Islands.' The 44 endemic species are considered with reference to their derivation or origin. Of these 14 appear to have reached the islands from the eastern United States by way of Florida, and 17 from the Greater Antilles, chiefly by way of Cuba, leaving 13 of doubtful or fortuitous origin.—J. A. A.

¹ Birds of the Bahama Islands. By Joseph H. Riley, Aid, Division of Birds, U. S. National Museum. From 'The Bahama Islands,' pp. 347-368. Published by the Geographical Society of Baltimore, 1905, George Burbank Shattuck, Ph. D., editor.

Bangs and Zappey's 'Birds of the Isle of Pines.'—In the 'American Naturalist' for April, 1905,¹ Messrs. Outram Bangs and W. R. Zappey published an annotated list of the birds of the Isle of Pines, off the southwestern end of Cuba, based mainly on Mr. Zappey's collections and field notes made in the spring and early summer of 1904. Use has been made also of the specimens and field notes obtained on the island in July, 1900, by Messrs. William Palmer and J. H. Riley, and of the records previously published by Poey, Cory, and Gundlach. The list contains 120 species and subspecies, of which six are described as new, namely: (1) *Ardea repens* (closely related to *A. occidentalis*), (2) *Grus nesiotus*, (3) *Saurothera merlini decolor*, (4) *Prionotelus temnurus vescus*, (5) *Myadestes eizabeth retrusus*, (6) *Spindalis pretrei pinus*. Besides the notes on habits and distribution there is critical comment on a number of species. The list is thus a summary of our present knowledge of the birds of this now ornithologically fairly well known island, which lies about 60 miles south of Cuba, with an area about equal to that of the state of Rhode Island. The physical aspects of the island are quite fully described, and there are several photographic illustrations and a map.—J. A. A.

Bangs on New American Birds.—In a recent paper² Mr. Bangs has described seven new subspecies of American birds, as follows: (1) *Crypturus soui mustelinus*, from the mountains near Santa Marta, Colombia, (2) *Scardufella inca dialeucos*, from the Honduras-Nicaragua boundary, 180 miles from the Pacific coast; (3) *Claravis pretiosa livida*, from the Rio Cauca, Colombia; (4) *Geotrygon martinica digressa*, from Guadeloupe Island, W. I.; (5) *Dacnis cayana callaina*, from Divala, Chiriqui; (6) *Calospiza lavinia cara*, from Ceiba, Honduras; (7) *Phanicothraupis rubica confinis*, from Yaruca, Honduras. Attention is also called to the preoccupation of the names *Columba squamosa* Temm. & Knip, for which *Scardafella ridgwayi* should be substituted, and of *Columba cinerea* Temm. & Knip, for which *Claravis pretiosa* (Ferrari-Perez) should be adopted. In an earlier paper³ (not previously here noticed) Mr. Bangs has described two subspecies of Tropical American Flycatchers, namely, *Serphophaga cinerea cana*, from the Sierra Nevada de Santa Marta, Colombia, and *Todirostrum cinereum finitimum*, from San Juan Bautista, Tabasco, Mexico.—J. A. A.

Thayer and Bangs on the Birds of Gorgona Island, Colombia.—In

¹ Birds of the Isle of Pines. By Outram Bangs and W. R. Zappey. Amer. Nat., Vol. XXXIX, No. 460, April, 1905, pp. 179-215. (Published April 26, 1905.)

² Descriptions of Seven New Subspecies of American Birds. By Outram Bangs. Proc. Biol. Soc. Washington, Vol. XVIII, pp. 151-156, June 9, 1905.

³ Two New Subspecies of Tropical American Tyrant Birds, *Ibid.*, Vol. XVII, pp. 113, 114, May 18, 1904.

The Auk' for 1904 (XXI, p. 408) reference was made to an expedition, sent out early in 1904 by the Hon. John E. Thayer for the purpose of exploring some of the little known islands and other parts of Panama and northern South America, he employing therefor the well-known zoölogical collector, Mr. Wilmot W. Brown, Jr. In the present paper¹ we have the first of a series of papers giving the scientific results of the expedition of 1904. Gorgona Island—a heavily wooded, uninhabited islet, five miles long by half a mile wide, situated about twenty miles off Punta las Reyes, Colombia—proved somewhat disappointing, its fauna being poor in both birds and mammals. The rainy season is perennial, and the vegetation so extremely dense as to be almost impenetrable. The island is of volcanic origin, and forms three peaks, the highest and central one having an altitude of about 800 feet. Mr. Brown found birds so scarce that often the result of a whole day's shooting would not exceed ten specimens, and the dampness was so great that artificial heat was necessary to dry the specimens of both birds and mammals to secure their preservation. Mr. Brown remained on the island about two weeks—June 19 to July 2, 1904.

The present paper includes reports on the mammals (by Mr. Bangs—5 species, two of them new), the birds (by Thayer and Bangs), and the reptiles and amphibians (by Thomas Barbour—13 species, four new). Fifteen species of birds were obtained most of them in small series, of which five are characterized as new, namely, *Sula etesiaca* (somewhat intermediate between *S. brewsteri* and *S. leucogastra*), *Urubitinga subtilis*, *Thamnophilus gorgonæ* (near *T. nævius* and *T. ambiguus*), *Cyanerpes gigas*, and *Cæreba gorgonæ*, the two latter apparently very distinct from their nearest allies.—J. A. A.

Nelson on the Names of Certain North American Birds, etc.—Mr. Nelson has recently described a new Whip-poor-will from Mexico (*Antrostomus notabilis*), based on specimens in the Sunnett collections in the American Museum of Natural History, from Victoria, Tamaulipas,² and has revised the names of several North American birds.³ The Booby, commonly known as *Sula sula*, is shown to be not the *Pelecanus sula* Linn. (1766), but should be called *Sula leucogastra* Boddaert (1783).

¹The Vertebrata of Gorgona Island, Colombia. Bull. Mus. Comp. Zoölogy, Vol. XLVI, No. 5, pp. 87-102, June, 1905. Aves. By John E. Thayer and Outram Bangs, pp. 91-98. (Papers from the John E. Thayer Expedition of 1904, No. 1.)

²Description of a New Species of Whip-poor-will from Mexico. By E. W. Nelson. Proc. Biol. Soc. Washington, Vol. XVIII, pp. 111, 112, March 31, 1905.

³Notes on the Names of certain North American Birds. *Ibid.*, pp. 121-126, April 28, 1905.

For the *Accipiter velox rufilatus* Ridgway (1888) an older name is found in *Nisus pacificus* Lesson (1845), based on specimens from the western coast of Mexico and California. As the western Sharp-shinned Hawk occurs at Acapulco "only as a winter visitor," Mr. Nelson decides that for this reason the California bird "may be taken as typical of this form." Possibly a recognizable Northwest Coast form of the Sharp-shinned Hawk may yet be found, with a limited and fairly well defined breeding range, but until this has been made out neither of these names — *pacificus* from California and *rufilatus*, based on Fort Bridger specimens — need to give the layman any anxiety. In all probability neither will be available for the hypothetical new form, being apparently pure synonyms of *velox*, which seems to range across the continent without any satisfactorily recognizable western form, Rocky Mountain, Great Basin, and most California specimens, when comparable as to season and age, being not appreciably different from the eastern bird.

The common Turkey Buzzard of North America is shown to be separable from the Turkey Buzzard of Mexico, the West Indies and tropical America generally, through its much larger size and slight color difference. These were noticed by Wied in 1839, and for this reason he proposed the name *septentrionalis* for the North American bird (type locality, New Harmony, Indiana), thus restricting the name *aura* Linn. to the smaller southern form. The North American Turkey Buzzard, as Mr. Nelson shows, must stand as *Cathartes aura septentrionalis* (Wied). The same point is made, apparently independently and almost simultaneously, by Mr. Bangs in his 'Birds of the Isle of Pines' (Amer. Nat., April, 1905, p. 190, published April 26).

Mr. Nelson further shows that the Red-eyed Cowbird was first described by Lesson in 1839 as *Tangavius involucratus*, which name must replace the now current but much later *Calliothrus robustus*. According to Mr. Nelson the three Mexican forms of *Tangavius* are merely subspecies and not species, so that the full name of our bird becomes *Tangavius æneus involucratus* (Lesson). — J. A. A.

Schiøeler on the Greenland Mallard.¹ — On the basis of a comparison of a large series of specimens of the Mallard from Greenland with specimens from Denmark Mr. Schiøeler has separated the Greenland form as a subspecies under the name *Anas boschas spilogaster*. The Greenland form differs from true *boschas* in being larger, with a somewhat shorter bill, darker upperparts and much more heavily spotted underparts. A large number of specimens are described in detail (including tables of measurements), and three plates, from photographs, very clearly illustrate the color differences claimed. — J. A. A.

¹ Om dem grøenlandske Stokand, *Anas boschas spilogaster*. Af E. Lehn Schiøeler. Viedensk. Meddel. fra den naturh. Foren. i Kbhvn., 1905, pp. 129-148, pll. ii-iv.

Shelley's 'Birds of Africa,' Vol. IV, Pt. II.¹—The second part of volume IV, completing the volume, follows very promptly Part I, noticed in the April number of this Journal (Auk, XXII, pp. 228, 229), concluding the family Ploceidæ and carrying the species from No. 523 to No. 646. The seven colored plates, by H. Grönwold, beautifully illustrate fourteen species. We are glad to see the good progress which now marks this great undertaking, the scope and character of which have been fully explained in our notices of the earlier parts. — J. A. A.

NOTES AND NEWS.

WALTER E. BRYANT, a Corresponding Fellow of the American Ornithologist's Union, died in San Francisco, Cal., May 21, 1905. A biographical notice of Mr. Bryant will appear in a later number of this Journal.

ADOLPHE BOUCARD, a well-known ornithological explorer and collector, and the author of many papers and works on birds and insects, died at the residence of his son, 24 Stanley Gardens, Hampstead, N. W., England, March 15, 1905, at the age of 66 years. He was born in France in 1839, but passed the later years of his life at his villa near Ryde, in the Isle of Wight. He collected extensively in the different countries of Central America and in southern Mexico, where he lived for many years. There are probably few large museums which do not contain many examples of his beautifully prepared bird-skins. His ornithological publications comprise 'Catalogus Avium hucusque descriptarum' (1876), 'Genera of Hummingbirds' (1893-95), and various papers in 'The Ibis,' the 'Proceedings' of the Zoölogical Society of London, and elsewhere. In 1891 he began the publication of an ornithological journal called 'The Hummingbird,' of which five volumes were completed. The greater part of his large collection of birds, numbering about 25,000 specimens and including many types, was presented to the Musée d'Histoire Naturelle, of Paris, in 1895.

¹ The | Birds of Africa, | comprising all the species which occur | in the | Ethiopian Region. | By | G. E. Shelley, F. Z. S., F. R. G. S., &c. | (Late Grenadier Guards), | Author of "A Handbook to the Birds of Egypt," | "A Monograph of the Sun Birds," etc. | — | Vol. IV. | Part II. | — | London : | Published for the Author by | R. H. Porter, 7, Princes Street, Cavendish Square, W. | 1905. — Roy. 8vo, pp. vi + 289-511, pll. col. xxxvi-xlii. Price 31s. 6d. net.

THE FOURTH INTERNATIONAL ORNITHOLOGICAL CONGRESS was held in London, June 12-17, 1905, under the presidency of Dr. R. Bowdler Sharpe of the British Museum (Natural History). The Congress opened with an informal reception at the Imperial Institute on the evening of Monday, June 12, followed by daily sessions on Tuesday; Wednesday, Friday, and Saturday. Thursday was given over to an excursion to 'Tring,' where the members of the Congress were guests of the Hon. Walter Rothschild. On Friday afternoon the members were tendered a reception by the Right Hon the Lord Mayor of London at the Mansion House, and in the evening were given a dinner by the British Ornithologists' Union. On the evening of Wednesday a conversazione was held at the Natural History Museum. After the adjournment of the Congress excursions were made on Monday, June 19, to the Duke of Bedford's Park at Woburn; on Tuesday to Cambridge, where Professor Newton welcomed the members of the Congress, and luncheon was served at Magdalene College; on Wednesday an expedition was made to Flamborough Head in Yorkshire, the breeding place of many sea birds.

The Congress was marked by a large attendance of members, and the presentation of many noteworthy papers, and altogether was an occasion long to be remembered by those participating in its proceedings, and especially by the visiting member for the bountiful hospitality extended to them. In addition to the general meetings, the Congress was organized into sections, as follows: (1) Systematic Ornithology, Geographical Distribution, Anatomy and Palæontology; (2) Migration; (3) Biology, Nidification, Oölogy; (4) Economic Ornithology and Bird Protection; (5) Aviculture. It is impracticable at the date of this writing to give any account of the papers presented, which we hope to do in a later issue of this journal. Among the members of the A. O. U. present were the Misses Florence and Maria R. Audubon, Frank M. Chapman, Dr. J. Dwight, Jr., James H. Fleming, and Dr. L. Stejneger. Papers were presented by Chapman, Dwight, and Fleming.

MR. ROBERT RIDGWAY has recently returned from a six months' collecting trip to Costa Rica, made in the interests of the U. S. National Museum. The objects of his visit were to secure material for use in the preparation of his 'Birds of North and Middle America'; to familiarize himself with the topographic and climatic conditions of that ornithological paradise, and with the birds in life; and to study the birds in the rich collection of the Museo Nacional, at San José.

With San José as his headquarters, and as the guest of the well-known Costa Rican ornithologist, Mr. Zeledon, he was enabled to reach several of the more interesting localities, such as Turrucares, Santo Domingo, and Pigres on the Pacific side of the country, Monte Redondo on the south side of the Candelaria range, Turrialba, Bonilda, and Coliblanco on the Atlantic slope, and the volcanos of Poás, Irazú, and Turrialba of the Central Cordillera. On these several expeditions he was accompanied

by his friends, Messrs. Alfaro and Zeledon, to whose ready assistance and knowledge of the country much of the success of his trip was due.

In the vicinity of Pigres, at the entrance of the Gulf of Nicoya, the party made the acquaintance of *Arinia boucardi*, a hummingbird known only from the original pair, collected in 1876, by the late M. Boucard. At Bonilda they found the rare cuckoo, *Neomorphus salvini*, and such desirable tanagers as *Calospiza florida* and *C. guttata*; while on the Volcano of Turrialba specimens of *Empidonax atriceps*, *Contopus ochraceus* and two new species of *Chlorospingus* were secured.

Knowing so well the Costa Rican material contained in the National Museum, Mr. Ridgway was enabled to direct his attention to filling gaps in the collection, and, although nearly three months elapsed before the arrival of his outfit, he succeeded in bringing back over 1300 very desirable specimens, representing many important desiderata. A number of species interesting from an anatomical view point were preserved in alcohol.

MAJOR EDGAR A. MEARNS, Medical Corps, U. S. Army, who has been in this country for a number of months on sick leave, is about to return to his post of duty in the Philippines, and will doubtless be able to resume, as circumstances may favor, his important natural history explorations begun during his former official sojourn of nearly two years in these islands. These resulted in his discovery of several new genera, and many new species and subspecies, of both birds and mammals, which he has been able promptly to publish during his enforced leave of absence in the United States.

Messrs. E. W. Nelson and E. A. Goldman are devoting the present season to a careful reconnaissance of the peninsula of Lower California and its islands, especially those in the Gulf of California.

Dr. Merriam, Chief of the Biological Survey (now raised from a Division to the rank of a Bureau of the Department of Agriculture), is continuing his survey of California, and Mr. and Mrs. Vernon Baily are continuing their work in New Mexico.

THE ONE hundred and twenty-fifth anniversary of the birth of John James Audubon was commemorated by appropriate exercises in the Church of the Intercession, Broadway and 158th Street, New York City, on the evening of May 4, 1905. Addresses were made by the Hon. Alton B. Parker, Mr. Richard Watson Gilder, Mr. Frank M. Chapman, Mr. Ernest Thompson Seton, and others, with an original poem by Mr. Edward Doyle. At the American Museum of Natural History a large collection of Auduboniana was placed on temporary exhibition in honor of the occasion, including the portfolio used by Audubon in soliciting subscriptions to his great work, many of his original drawings, his hunting coat, gun, and other mementoes of his early wanderings in Labrador and the Far West.

A 'SUPPLEMENT' to the 'Birds of New Zealand' is announced, to form two quarto volumes, with twelve hand-colored plates (by Keulemans) and numerous text illustrations. The subscription price is three guineas per volume, and the edition will be limited to 500 copies. During the seventeen years that have passed since the publication of the second edition, quite a number of species have been added to the bird fauna of New Zealand, and much new information respecting those previously known, and in place of issuing a third edition the author, Sir Walter L. Buller, has decided to issue two supplemental volumes, in the same style as the original work. Subscriptions are to be addressed: "To the Publisher of the Supplement to the 'Birds of New Zealand,' 62 London Wall, London, E. C."

WE HAVE received also the prospectus of a work entitled 'The Eggs of European Birds,' by the Rev. Francis C. R. Jourdain, to be published in ten parts, octavo size, each to contain twelve or more colored plates. The price is 10 shillings per part, and subscriptions may be sent to the Author, Clifton Vicarage, Ashburne, Derbyshire, or to Mr. R. H. Porter, 7 Princes St., Cavendish Square, London, W.

A NEW natural history journal is 'The Ontario Natural Science Bulletin: Journal of the Wellington Field Naturalists' Club,' of Guelph, Ontario, Canada, an annual, of which No. 1 was published April 16, 1905. It is an octavo of 48 pages, of which pages 1-24, 38-41, and 43-45 are ornithological, the remaining portions dealing with mammals and botany. The editor is Mr. A. B. Klugh, Guelph, Ont., and the price is 25 cents. The bird papers are: 'The Birds of Wellington County, Ontario,' by A. B. Klugh (pp. 1-10, 197 species); 'An Unusual Migration of the Canada Jay,' by J. H. Fleming; 'The Origin of the Kirtland's Warbler,' by P. A. Taverner; 'The Thrushes of Eastern Ontario,' by C. J. Young; 'Migration Report, Guelph, Ontario, March 1, 1904-March 1, 1905,' pp. 21-24 (tabular, and anonymous). There are several pages each of ornithological 'Notes,' and of brief reviews of ornithological publications.

THE annual meeting of the Michigan Ornithological Club was held in the University of Michigan Museum at Ann Arbor on April 1, 1905, at which the following papers were read: 'Recent Advances in Ornithology,' Walter B. Barrows; 'In Memoriam—Albert Bowen Durfee,' Leon J. Cole; 'Birds Noted en route to Northern Michigan,' Norman A. Wood; 'Ecological Distribution of the Birds of the Porcupine Mountains, Michigan,' Otto McCreary; 'Observations on the Nesting Habits of a Pair of House Wrens,' Max M. Peet; 'On the Use in Surgery of Tendons of the Ardeidae and Gruidae,' Alex. W. Blain, Jr.; 'Some New and Rare Records for Michigan,' Norman A. Wood; 'A List of Birds from the Michigan Forest Reserve, Crawford County,' Earl H. Frothingham; 'The

Occurrence of Bewick's Wren at Grand Rapids,' Leon J. Cole; 'A Preliminary Notice of an Interesting Migration Route,' P. A. Taverner.

The following officers were elected for 1905-06: President, Walter B. Barrows; Vice-Presidents, A. H. Griffith, James B. Purdy, and J. Claire Wood; Secretary, Alex. W. Blain, Jr.; Treasurer, Frederick C. Hubel. Editorial Staff of the 'Bulletin': Walter B. Barrows, Editor; P. A. Taverner and Norman A. Wood, Associates.

THE American Ornithologists' Union Committee on the Classification and Nomenclature of North American Birds held a four days' session in April last at the U. S. National Museum in Washington, with all the members present except Mr. Ridgway, who was in Costa Rica. Final action was taken on about one hundred cases, thus disposing of the greater part of those listed for consideration. A number of others were considered, but final action on them was deferred, owing to lack of material or unexpected complications in questions of nomenclature. These were all assigned to subcommittees, to be reported upon at the next meeting of the Committee. As the greater part of the cases acted upon had previously been considered by subcommittees, they were more readily decided than would have been otherwise possible.

At the conclusion of the session the Committee decided not to issue a report of its decisions in the form of a Supplement to the Check-List, as has been heretofore customary, in view of the fact that a new edition of the Check-List is under consideration for publication in 1906.

Sharpe, R. Bowler. (1) Report on the Collections of Natural History made in the Antarctic Regions during the Voyage of the 'Southern Cross'. IV, Aves, pp. 166-173, pl. vi + x. 1902. (2) Extracts from the Diary of the late Nikolai Hansen. (*Ibid.*, pp. 79-105.)

Shelley, G. E. The Birds of Africa. Vol. IV, Part 2, 1 p. vi + 289-311, pl. col. xxxvi xlii. R. H. Porter, London. 31s. 6d. net.

Taverner, P. A. The Origin of Kittland's Warbler. (Ontario Nat. Sci. Bull., Guelph, Ont., No. 1, pp. 13-17, April 15, 1905.)

Thayer, John E., and Outram Bangs. The Vertebrata of Gorgona Island, Colombia. IV, Aves, (Bull. Mus. Comp. Zool., XLVI, No. 6, pp. 91-98 [June, 1905].)

Townsend, Charles Wendell. The Birds of Essex County, Massachusetts. (Mem. Nuttall Orn. Club, No. III, April, 1905. 4to, pp. 352, frontispiece and map.)

American Ornithology, V, April-June, 1905.

Anales del Museo Nacional de Montevideo, II, Entr. 2, 1905.

Annals of Scottish Nat. Hist. April, 1905.

Annual Report Field Columbian Museum, for 1903-1904.

Avicultural Magazine, N. S., III, April-June, 1905.

Bird Lore, VII, Nos. 2 and 3, March-April, May-June, 1905.

Birds and Nature, XVII, Nos. 4, 5. XVIII, No. 1, April-June, 1905.

Bulletin British Orn. Club, CXLV, CXLV, March, April, 1905.

Condor, The, VII, No. 3, 1905.

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Forest and Stream, LXIV, Nos. 13-26, 1905.

Journal Maine Orn. Soc., VII, No. 2, June, 1905.

Knowledge, N. S., Nos. 3-6, March-June, 1905.

Monthly Bulletin, Divis. Zoology, Penn. Dept. Agric., II, Nos. 10-12, III, No. 1, Feb.-May, 1905.

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Nature Notes, the Magazine of the Belborne Society, XVI, Nos. 183 and 185, 1905.

Ontario Natural Science Bulletin, 1, No. 1, April, 1905.

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Ottawa Naturalist, XIX, Nos. 1-3, April-June, 1905.

Our Avian Friends, XXXII, Nos. 8-10, April-June, 1905.

Proceedings California Acad. Sci. Ser. 3, title pages and indexes to Vols. I-III. Vol. III, No. 13, Dec., 1904.

Proceedings Acad. Nat. Sci. Philadelphia LVII, pt. 1, Jan.-March, 1905.

Science, N. S., XXI, Nos. 535-548, 1905.

University of Cantor Publications, Zoology, II, No. 3, Jan., 1905.

Warbler The, 2d Ser., I, No. 2, 1905.

Wilson Bulletin, The, N. S., XII, No. 2, June, 1905.

Zoological Quarterly Bulletin, II, No. 4, Feb., 1905.

Zoologist The, 4th Ser., IX, Nos. 100-102, April-June, 1905.

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Bangs, Outram, and W. R. Zappey. Birds of the Isle of Pines. (Amer Nat., XXXIX, April 1905, pp. 179-215.) See also Thayer John E.

Blain, Alexander W. On the Use in Surgery of Tendons of the Ardeidae and Gruidae. (Science, N. S. XXI, pp. 708-710, May 5, 1905.)

Chapman, Frank M. A Contribution to the Life History of the American Flamingo (*Phoenicopterus ruber*), with Remarks upon Specimens. (Bull. Am Mus Nat Hist. XXI, 1905, pp. 53-77, June 15, 1905.)

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Job, Herbert K. Wild Wings, Adventures of a Camera Hunter among the larger Wild Birds of North America on Land and Sea. 8vo, pp. xxviii + 342, 100 half-tone cuts and plates, Houghton, Mifflin & Co. \$3.00 net.

Nelson, F. W. (1) Notes on the Names of Certain North American Birds. (Proc Biol Soc Wash. XVIII, pp. 121-126, April 18, 1905) (2) Description of a new species of Whip-poor-will from Mexico. (*Ibid.*, pp. 111, 112, March 31, 1905.)

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Rathbun, Richard. The United States National Museum. An account of the Buildings occupied by the National Collections. (Rep. U. S. Nat. Mus. for 1903-1905, pp. 177-300.)

Riley, Joseph H. Birds of the Bahama Islands. (The Bahama Islands, 1905, pp. 347-368.)

Schmøler, E. Lehn. Om den grønlandske Storkend *Anas boschaspelegaster*. (Vidensk. Meddel. fra den naturh. i Kbhvn. 1905, pp. 127-148, pl. II-IV.)

(Continued on 3rd page of Cover.)

Old
Series,
Vol. XXX

CONTINUATION OF THE
BULLETIN OF THE NUTTALL ORNITHOLOGICAL CLUB

New.
Series,
Vol. XXII

The Auk

A Quarterly Journal of Ornithology

Vol XXII — OCTOBER, 1905 —

No. 4



PUBLISHED BY

The American Ornithologists' Union

CAMBRIDGE, MASS.

Entered as second-class mail matter in the Post Office at Boston, Mass.

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'THE AUK,' published quarterly as the Organ of the AMERICAN ORNITHOLOGISTS' UNION, is edited by Dr. J. A. ALLEN, with the assistance of Mr. FRANK M. CHAPMAN.

TERMS.—\$3.00 a year, including postage, strictly in advance. Single numbers, 75 cents. Free to Honorary Fellows and to Fellows, Members, and Associates of the A. O. U. not in arrears for dues.

Subscriptions should be addressed to DR. JONATHAN DWIGHT, Jr., Business Manager, 2 EAST 34TH ST., NEW YORK, N. Y. Foreign Subscribers may obtain 'THE AUK' through R. H. PORTER, 7 PRINCES STREET, CAVENDISH SQUARE, W., LONDON.

All articles and communications intended for publication and all books and publications for notice, should be sent to Dr. J. A. ALLEN, AMERICAN MUSEUM OF NATURAL HISTORY, 77TH ST. AND CENTRAL PARK, WEST, NEW YORK CITY.

Manuscripts for general articles should reach the editor at least six weeks before the date of the number for which they are intended, and manuscripts for 'General Notes' and 'Recent Literature' not later than the first of the month preceding the date of the number in which it is desired they shall appear.

THE AUK:

A QUARTERLY JOURNAL OF ORNITHOLOGY.

VOL. XXII.

OCTOBER, 1905.

No. 4.

THE WEST INDIAN PARROTS.

BY AUSTIN H. CLARK.

FROM the writings of the earlier authors on West Indian subjects who include in their works accounts of the ornithology of those islands as it was in their time, we find that (although the continental systematists included many species which we have no reason to suppose ever inhabited the islands) there were then certain now unrecognized, but apparently well-authenticated forms, bridging over gaps in the avifauna of the district as we understand it at the present day. That these early writers were aware of the difference in the ornithological conditions in the various islands, and of the differences between the avifauna of the islands and that of the mainland, is amply proved by their statements; and I see no reason why we should not accept their assertions as true, at any rate until they can be proved to be false.

The only genera of Psittaci which appear ever to have occurred in the West Indies are *Ara* (Martinique, ? Dominica, Guadeloupe: Haiti, Cuba, including the Isle of Pines, and Jamaica; now everywhere extinct), *Amazona* (St. Vincent, St. Lucia, Martinique, Dominica, Guadeloupe: Porto Rico, Haiti, the Bahamas, Cuba, Grand Cayman, and Jamaica, extinct on Martinique and Guadeloupe), and *Conurus* (Barbados, Martinique, Dominica, Guadeloupe: St. Croix, St. Thomas, Porto Rico, Haiti, Cuba, and Jamaica, extinct in the Lesser Antilles). We thus have two distinct faunal areas indicated by West Indian Psittaci; (1) a Greater Antillean, with its center at Jamaica (*Ara*, two species of *Amazona*, *Conurus*), extending to Cuba and Haiti (*Ara*, *Amazona*,

Conurus), Porto Rico (*Amazona*, *Conurus*), the Bahamas (*Amazona*), St. Thomas and St. Croix (*Conurus*); and (2) a Lesser Antillean, with its center at Dominica (*Ara*, two species of *Amazona*, *Conurus*), extending to Guadeloupe and Martinique (*Ara*, *Amazona*, *Conurus*), and southward to St. Lucia (*Amazona*), St. Vincent (*Amazona*), and Barbados (*Conurus*). We have no trustworthy evidence that any of the Psittaci ever occurred on Grenada or the Grenadines (southern Lesser Antilles), Montserrat, Antigua, Barbuda, Nevis, St. Kitts, or on the small islands between St. Kitts and St. Croix (northern Lesser Antilles); thus these two faunal areas (I am speaking of the Psittaci alone) are entirely separated from each other, and the Lesser Antillean is separated from the continental (as represented by Trinidad with continental species of *Ara*, *Amazona*, *Pionus*, and *Urochroma*,¹ and Tobago with *Amazona* and *Pionus*) by another wide gap. None of the South American forms occur nearer to the Greater Antilles than Yucatan, and are there represented by quite different species.²

At the present day *Ara* has disappeared from these islands, *Amazona* has been extirpated from Guadeloupe and Martinique, and *Conurus* from all parts of its Lesser Antillean range.

GREATER ANTILLES.

Fortunately, all the species of *Amazona* which have been recorded from the Greater Antilles have survived, though in greatly diminished numbers, to the present day. They are:

Jamaica: *Amazona collaria* (Linn.); *A. agilis* (Linn.).

Cuba: *A. leucocephala* (Linn.), var. (a) albinistic, *paradisi* Linn.

Bahamas: *A. leucocephala bahamensis* Bryant.

Haiti: *A. salliei* (Scl.).

Porto Rico: *A. vittata* (Bodd.).

¹ *Conurus* does not appear to occur in Trinidad, although recorded from there by a number of authors.

² *Conuropsis* occurs in Florida; the white-headed Greater Antillean parrots appear to be allied to *Amazona albifrons* of Central America, and the Lesser Antillean species to *A. vinacea* of Brazil.

Among the earlier authors we find other species, which have been erroneously credited to these islands; these are:

Jamaica : *Amazona æstiva* (Linn.), Brisson, Orn. IV, p. 277, 1760, "Psittacus amazonicus jamaicensis."¹

A. amazonica (Linn.), Brisson, *l. c.* p. 233, "Psittacus Jamaicensis icterocephalus" (variety).

Psittacus erithacus Linn., Linnæus, Syst. nat. I, p. 144, no. 24, 1766.²

Cuba : *A. versicolor* (Müll.), D' Aubenton, Pl. Enl. 360, "Le Perroquet de la Havane."

Haiti : *A. vittata* (Bodd.), D' Aubenton, Pl. Enl. 792, "Le Perroquet de St. Domingue."

LESSER ANTILLES.

GUADELOUPE.—Dutertre, in his 'Histoire Générale des Isles des Christophe, de la Guadeloupe, de la Martinique, et autres dans l'Amérique' (Paris, 1654), says (p. 298): "The Parrot of Guadeloupe is almost as large as a fowl. The beak and the eye are bordered with carnation. All the feathers of the head, neck, and underparts are of a violet color, mixed with a little green and black, and changeable like the throat of a pigeon.³ All the upper part of the back is brownish green. The long quills are black, the others yellow, green, and red, and it has on the wing-coverts two rosettes of rose color. When it erects the feathers of its neck, it makes a beautiful ruff about its head,⁴ which it seems to admire, as a peacock its tail. It has a strong voice, talks very distinctly, and learns quickly if taken young. It lives on the wild

¹ I have only given one reference in each case.

² The habitat is given by Linnæus as Guinea and Jamaica. The species was probably often brought to Jamaica in slave ships and reshipped to Europe.

³ It is not remarkable that the bird is described as iridescent; freshly killed birds of several species of *Amazona* (perhaps most noticeable in *A. guildingii*) examined in the field appear to possess this quality to a greater or lesser degree.

⁴ Other species of *Amazona* when excited can raise a "ruff" about their neck. I have noticed it particularly in *A. guildingii*.

fruits which grow in the forests, except that it does not eat the manchioneel. Cotton seed intoxicates it, and affects it as wine does a man, and for that reason they eat it with great eagerness.

"The flavor of its flesh is excellent, but changeable, according to the kind of food. If it eats cashew nuts, the flesh has an agreeable flavor of garlic; if 'bois des inde' it has a flavor of cloves and cinnamon; if on bitter fruits, it becomes bitter like gall. If it feeds on genips, the flesh becomes wholly black, but that does not prevent its having a very fine flavor. When it feeds on guavas it is at its best, and then the French commit great havoc among them."

Later, in his '*Histoire Générale des Antilles*¹ habitées par les François' (II, p. 250), he repeats this description and adds: "We had two which built their nest a hundred paces from our house in a large tree. The male and the female sat alternately, and came one after the other to feed at the house, where they brought their young when they were large enough to leave the nest."

In the '*Histoire Naturelle et Morale des Isles Antilles de l'Amérique*' (Rotterdam, 1658)² we find (p. 157; 2nd. edition, p. 175): "There are in almost all the Antilles Parrots, which the Indian inhabitants call in their language 'Kouléhuéc,' and which go in flocks like starlings. The hunters place them in the rank of game birds, and do not think it a waste of powder to shoot them; for they are as good and fat as the best fowl, especially when young, and at the season of the fruiting of the many trees upon which they feed. They are of different sizes and colors in the different islands, so that the old inhabitants can tell the place of their birth by their size and color."

Père Labat in his '*Nouveau Voyage aux Isles de l'Amérique*'³ (II, p. 214, 1742) says: "The Parrots of these islands are distinguishable from those of the mainland of Guinea (? Guiana) by

¹ In three volumes; Vols. I, II, 1667; Vol. III, 1671. Antilles is spelt Ant-Iles in the third volume to agree with a theory of the author's as to the derivation of the word.

² Anonymous, but credited to C. César de Rochefort. A second edition appeared in 1665.

³ In five volumes; there is an earlier edition (Paris, 1722) in ten volumes which I have not been able to examine.

their different plumage; those of Guadeloupe are a little smaller than the Macaws. The head, neck, and underparts are slaty, with a few green and black feathers; the back is wholly green, the wings green, yellow, and red."

Brisson (Orn. IV, p. 302, 1760), under "Le Perroquet de la Guadeloupe, *Psittacus aquarum lupiarum insulæ*," says: "*Psittacus major brevicaudatus, superne viridis, inferne cinereo-cærulescens, capito et collo cinereo-cærulescentibus, viridi et nigro variegatis; rectribus viridibus.* Head, throat, and neck ashy bluish, varied with green and black. Back and rump green. Upper tail-coverts and scapulars green. Under parts, sides, thighs, and under tail-coverts, ashy bluish. Wings green, varied with red and yellow. Found in Guadeloupe."

Buffon (Hist. Nat. Ois. VI, p. 233, 1779), under "Le Craik à tête violette," quotes Dutertre's descriptions given above and says: "We have never seen this parrot, and it is not found in Cayenne. It is even very rare in Guadeloupe to-day, for none of the inhabitants of that island have given us any information concerning it; but that is not extraordinary, for since the islands have been inhabited, the number of parrots has greatly diminished, and Dutertre remarks in particular of this one that the French colonists wage a terrible war on it in the season when it is especially fat and succulent."

Latham (Gen. Hist. Birds, IV, p. 217, 1822) refers to this bird under the name of "The Ruff-necked Parrot," and quotes Dutertre's description.

Gmelin has given (Syst. Nat. I, p. 337, 1789) the name *Ps[ittacus] violaceus*, based on the "*Psittacus aquarum Lupiarum insulæ*" of Brisson, "Crick à tête violette" of Buffon, and "Le Perroquet de la Guadeloupe" of Dutertre.

These are the chief references to this bird, which appears to have become extinct at a very early date. Count Salvadori (Cat. Birds Brit. Mus. XX, p. 336, 1891) refers this bird to *Deroptyus accipitrinus* (Linn.), a continental species¹ ranging from Guiana southward and westward through the Amazons valley. The genus *Deroptyus* is characterized (in part) by having a comparatively

¹ The genus is monotypic.

long tail (more than two thirds of the length of the wing) and the feathers of the hind neck very long, broad, and erectile. *D. accipitrinus* is colored as follows: green; head brown, pileum grayish white; breast and abdomen, and long feathers of nape, dark red with blue edges; wings green and black, slightly tinged with blue on the tips of the secondaries; tail green; measurements: length, 14 in., wing 8 in., tail 6.4 in. The only apparent reason for referring the Guadeloupe bird to this form appears to be the mention of its having a frill about its neck, a peculiarity common (although not in such a marked degree as in *Deroptus*) to several species of *Amazona*. The colors of the two birds are quite different as given; we have good evidence that the parrots of Guadeloupe really did exist, and Buffon states that it is not found in Cayenne (in the habitat of *D. accipitrinus*.) *D. accipitrinus* was well known to Buffon, and is figured in the Planches Enluménées (No. 526).

The Guadeloupe parrot appears to have been most nearly related to *Amazona imperialis* Richm.¹ of Dominica, at present the largest of the genus.

The color of the two birds is

A. imperialis.

Head, neck, and underparts dark purple blue.

Upper parts green.

Wing: primaries dark brown; secondaries purple, green, and blue; speculum, and metacarpal edge, crimson.

Orbital ring and cere grayish blue.

Parrot of Guadeloupe.

Head, neck, and underparts violet, mixed with a little green and black² (Dutertre); slaty (Labat); ashy bluish (Brisson).

Upper parts brownish green³ (Dutertre); green (Labat; Brisson).

Wing: long quills black, other feathers yellow, green, and red⁴ (Dutertre); green, yellow and red (Labat).

Orbital ring and cere red (Dutertre).

¹ *Augusta* Vigors; vide Richmond, Auk, XVI, p. 186, 1899.

² Possibly the borderings of the feathers (*A. imperialis* has the feathers edged with black). The green may be an evidence of immaturity; the young of *A. guildingii* is green.

³ *A. guildingii* when not quite adult is brownish green.

⁴ Dutertre's "rosettes" are probably scattered feathers in the lesser wing coverts.

I propose, then, that the following species be admitted to a place in the Lesser Antillean avifauna.

***Amazona violacea* (Gmel.).**

GADELOUPE PARROT.

Characters. Nearest to *A. imperialis* of Dominica. Size large; head and underparts violet or slaty gray. Wings green, varied with red and yellow; longest quills black.

Habitat. Guadeloupe.

No other parrot has ever been mentioned as occurring in Guadeloupe.

DOMINICA.—*Amazona imperialis* Richm. *A. bouqueti* (Bechst.).

MARTINIQUE.—Although all the earlier writers mention parrots on Martinique, they give us no detailed account of them. Labat says, "The Parrot is too common a bird for me to stop to give a description of it." He says later, however (II, p. 214) that the parrot "of Dominica has some red feathers in its wings, in its tail, and under the throat (*A. bouqueti*)." "That of Martinique (*loc. cit.*) resembles it, except that the top of the head is slate color, with a little red."

Buffon says (Hist. Nat. Ois. VI, p. 214): "The Parrot of Martinique, mentioned by Père Labat, which has the top of the head slaty with a few spots of red is, as is seen, different from our 'White Headed Parrot' (*A. leucocephala*) and M. Brisson states without foundation that it is the same."

For the sake of completing the list of this genus in the Lesser Antilles, we may adopt, provisionally, for this species, the name of

***Amazona martinicana* nom. nov.**

The following species have been erroneously credited to Martinique:

Amazona sallæi (Scl.), D'Aubenton, Pl. Enl. 548, "Le Perroquet à ventre pourpre de la Martinique."

A. leucocephala (Linn.), Brisson, Orn. IV, p. 242, 1760. "Psittacus Martinicanus."

ST. LUCIA.—*Amazona versicolor* (Müll.).

ST. VINCENT.—*A. guildingii* (Vig.).¹

The species of *Amazona* known from the West Indies are :

Amazona agilis (Linn.). *Jamaica*.

Amazona collaria (Linn.). *Jamaica*.

“ *caymanensis* (Cory). *Grand Cayman*.

“ *leucocephala* (Linn.). *Cuba*.

“ “ *bahamensis* Bryant. *Bahamas*.

“ *sallæi* (Scl.). *Haiti*.

Amazona vittata (Bodd.). *Porto Rico*.

Amazona violacea (Gmel.) *Guadeloupe*.²

“ *imperialis* Richm. *Dominica*.

Amazona bouqueti (Bechst.). *Dominica*.²

“ *martinicana* nom. nov. *Martinique*.

Amazona versicolor (Müll.). *St. Lucia*.

Amazona guildingii (Vig.). *St. Vincent*.

¹ Concerning parrots in Barbados, Sir Hans Sloane says (Nat. Hist. Jamaica, I, p. 34. 1707): “Turner (ap. Purchas. p. 1265) found Hogs, Pigeons. and Parrots here (Barbados). This is the only statement I can find of their occurrence on that island by a person who actually visited the place. Albin (Nat. Hist. Birds, III, p. 11, pl. 11, 1738, “The Barbados Parrot”). Edwards (Birds, IV, p. 162, 1751, “The Great Green Parrot from the West Indies” [Barbados]; *loc. cit.* p. 246, “*Psittacus viridis major occidentalis*”). Latham (Gen. Syn. I, p. 284, No. 90, 1781 “The Ash-fronted Parrot” [Barbados]; Gen. History, II, p. 238, 1822). Brisson (Orn. IV, p. 236, 1760, “Le Perroquet des Barbades . . . *Psittacus Barbadosis*”) and Gmelin (Syst. Nat. I, p. 339, 1788 “*Psittacus barbadensis*”). These authors all give a parrot as having inhabited Barbados. The species as described is referable in all cases to varieties of *A. aestiva* or *A. ochroptera*. Possibly there was an *Amazona* on the island at the time of its colonization allied to these species, but there is no definite proof that such was the case. If there were parrots there, they might very well have been members of this group, as species occur on Trinidad and on Tobago. The evidence of the occurrence of parrots on Grenada is very poor, the single reference (Dutertre, Hist. Gén. des Antilles habitées par les François, II, p. 249, 1667) possibly referring to Tobago.

² Extinct.

THE GREATER ANTILLEAN MACAWS.

BY AUSTIN H. CLARK.

THE following continental species of Macaws have been erroneously credited to the Greater Antilles by the earlier writers. The mistakes apparently arose from the birds having been brought from the Mosquito Coast (or some other part of Central or South America), by ships trading locally, to Jamaica, and then, after a residence in that island, being reshipped to England or to Europe as natives there. The interior of Jamaica was then much less known than was the interior of Cuba or Haiti; thus species which would have been at once recognized as foreign to those islands passed as resident on Jamaica. Moreover, what appear to have been escaped birds were occasionally killed in the woods (*vide* Browne, Civil and Nat. Hist. Jamaica, p. 472, 1789, under "*The Blue Macaw of Edwards*"), which tended to confirm people in their ideas that the birds were natives, they believing that they were stragglers from their inaccessible mountain homes.

Now Macaws, like Parrots, although birds of powerful flight and spending much time on the wing, seldom pass over any great extent of water. Although larger and stronger than parrots, they appear to be even more attached to the mainland than are they; whereas species of the genus *Amazona* are found on Cozumel, Tres Marias, Tigre and Ruatan (in the Bay of Honduras), Aruba, Curaçao, Margarita, Trinidad, Tobago, and other islands off the northern South American coast (I do not consider in this connection the species peculiar to, and occurring on, the West Indies). Macaws have only been reported from Trinidad, and no specimens appear ever to have been obtained there (*Ara makawanna* Léotaud, Ois. de l'île de la Trinidad, app. p. 557, 1866; Chapm. Bull. Am. Mus. Nat. Hist. VI, p. 66. 1894).¹ It appears, therefore, very unlikely that any continental species could ever have strayed

¹ Count Salvadori (Cat. Birds Brit. Mus. XX, p. 168, 1891) gives Trinidad in the range of *A. hahni*, and mentions an unsexed skin (purchased) from that island. Possibly Léotaud's species was in reality *A. hahni*. Some species of green macaw certainly does occur there.

as far as Jamaica, although it is possible that they occasionally escaped and were killed in an apparently feral state in the woods. I have known of *A. ararauna* and *A. macao* being killed on the island of Barbados, probably having come from ships at anchor in the harbor, and, of course parrots (and in one case I know of *A. macao*) are sometimes shot even in the woods of New England.

Ara ararauna (Linn.).

BLUE AND YELLOW MACAW.

Jamaica, SLOANE, Nat. Hist. Jamaica, II, p. 296, 1725. "VI. *Psittacus maximus cyanocroceus*." — ALBIN, Nat. Hist. Birds, II, p. 16, 1738. "The Maccaw from Jamaica" (part).¹ — BRISSON, Orn. IV, p. 191, 1760. "*Ara jamaicensis cyanocrocea*." — BROWNE, Civil and Nat. Hist. Jamaica, p. 472, 1789 "The Blue Mackaw of Edwards." — LATHAM, Gen. Hist. Birds, II, p. 107, 1822. "The Blue and Yellow Maccaw."²

*Ara macao*³ (Linn.).

RED AND YELLOW MACAW.

Jamaica, ALBIN, *loc. cit.* BRISSON, *loc. cit.* p. 188. "*Ara jamaicensis*."

¹ Albin figures a Red and Blue Macaw (pl. 17) as from Jamaica, saying it is the male of the Blue and Yellow Macaw. It was probably intended to represent *A. macao* (possibly colored from memory) which was commonly considered the male of *A. ararauna*.

² The reference to Latham's 'Index' and 'Synopsis' are contained in this work, and are therefore not given here.

³ The name "*macao*" was given because the bird was supposed to have come from Macao, near Hong Kong. The English word Macaw is said by some to have been derived from it.

***Ara chloroptera* (Souance).**

RED AND BLUE MACAW.

LATHAM, *loc. cit.* p. 102 "Red and Blue Maccaw," (occurs on "some of the islands [Antilles] also," as well as on the continent).

***Ara severa* (Linn.).**

Jamaica, BRISSON, *loc. cit.*, p. 202. "*Ara brasiliensis erythrochlora*." — LATHAM, *loc. cit.* p. 112. "Brazilian Green Maccaw" (refers to Edwards [Glean.], pl. 229 [1758]).

***Ara militaris* (Linn.).**

MILITARY MACAW.

Gosse (Birds of Jamaica, p. 261, 1847) supposes that this species might have been a native of Jamaica, living in the wilder mountain regions, and remarks that every description he received of the bird agreed with that of *A. militaris*, "the Great Green Macaw of Mexico." I agree with Mr. Cory¹ that "it is not impossible that *Ara militaris* may have occurred in Cuba and Jamaica, but it is improbable. The bird recorded as such was perhaps *A. tricolor* wrongly identified."²

We have thus narrowed down the Greater Antillean Macaws to a single species (*A. tricolor*), which is not known outside of those islands; but which, like all the West Indian parrots (*Amazona*) is peculiarly Antillean.³ This species (or, perhaps, one closely related) appears certainly to have formerly lived on Jamaica. Sloane (Nat. Hist. Jamaica, II, p. 297, 1725) says, under "The Small Maccaw" ("The Great Maccaw," is *A. ararauna*): "They are very common in the woods, and are eaten as Pigeons, but when young are tamed and kept as Parrots."

¹ Birds W. I., p. 178.

² The young of *A. tricolor* appears to have been largely green.

³ I have not given all the references under the species listed above, but only such as seemed most important.

On Cuba this bird survived until very recent years, its last stronghold being the extensive swamps in the southern part of the island.

We find in Brisson (Orn. IV, p. 183, 1760, under "L' Ara Rouge"): "Macaws were formerly very common in Santo Domingo. I see from a letter of M. le Chevalier Deshayes that since the French settlements have been extended to the tops of the mountains, these birds have become less common." He quotes M. de le Borde, Médecin du Roi at Cayenne: "In all these islands (Antilles) the Macaws have become very rare, because the inhabitants destroy them for food. They retire into the less frequented districts, and do not come near the cultivated areas."

Brisson's is the only evidence I can find of any Macaws having lived in the island of Haiti; but the statement appears to be authoritative, and he speaks of the bird even at that time (1760) as rare.

I therefore propose the following as probably the true original status for the genus *Ara* in the West Indies.

Ara tricolor (Bechst.).

CUBAN MACAW.

HABITAT. Jamaica¹ (extinct); Cuba, including Isle of Pines (recently extinct); Haiti¹ (extinct).

Ara guadeloupensis Clark.²

LESSER ANTILLEAN MACAW.

HABITAT. Guadeloupe (extinct); ? Dominica¹ (extinct); Martinique¹ (extinct).

¹ Possibly a closely related species or subspecies.

² Auk, XXII, p. 272, July, 1905.

LIST OF BIRDS COLLECTED OR OBSERVED DURING THE BAHAMA EXPEDITION OF THE GEOGRAPHIC SOCIETY OF BALTIMORE.

BY J. H. RILEY.

DURING June and July, 1903, the author accompanied the Geographic Society of Baltimore's expedition to the Bahama Islands for the purpose of collecting reptiles, birds, and mammals for the U. S. National Museum. We sailed from Baltimore in the ninety-two ton schooner 'Van Name,' June 1, and arrived at Nassau, after a very stormy voyage, June 17, where we collected until June 24. Leaving Nassau, June 25, we arrived off Morgan's Bluff, Andros, the same evening and proceeded down the coast to Mangrove Cay where we arrived late the next morning. Here five of the party, including the author, the next day started in a small sponger to Grassy Creek. Arriving at the Creek early in the evening of June 28, we proceeded inland by boat and camped for the night on a small strip of dry ground. Part of the next day was spent in hunting Flamingoes, when we were obliged to leave to rejoin the ship at Green Cay which we did not succeed in doing until late in the evening of the following day, and then only to learn that it was necessary to put back to Nassau, to replenish our water supply. July 2, was spent at Nassau, when we sailed for Eleuthera, arriving off Spanish Wells late in the evening of the same day. On Eleuthera a short time was spent in collecting, varying from a few hours to a whole day, at The Bluff, Gregorytown, Governor's Harbor, and Powell's Point. About three hours of July 9, was spent on Cat Island and about the same time on Rum Cay the next day. July 11 to 13, was spent on Watlings Island and from July 14 to 17, on Long Island, at Clarence Harbor. We reached Nassau again on July 20, where we spent part of the day collecting. On July 22, we spent about four hours on Abaco, opposite Hopetown, which was the last collecting done, as we attempted to sail the next day for Baltimore, but as the wind failed after leaving the harbor we did not get started until the day after.

For a fuller account of the expedition, the geology, physical fea-

tures of the islands, etc., the reader is referred to the Society's Report¹ of which these notes were originally intended to form a part of the report on birds.

Owing to lack of time and the poor facilities for work our collections were not as large as we could have wished, and my only excuse for presenting such a meager list is that it is from a region of exceptional interest and which yet holds many unsolved problems for future investigation.

My thanks are due to Dr. George B. Shattuck, Captain Charles Flower, Mate Davis, many members of the expedition, and especially to Mr. S. H. Derickson, who was also collecting birds, for many favors rendered me during the trip.

1. *Colymbus dominicus* Linn. ST. DOMINGO GREBE.—Two were seen on a small lake on Rum Cay; one on a small pond on Watlings Island; and several on the salt pans around Clarence Harbor, Long Island.

2. *Puffinus lherminieri* Lesson? ANTILLEAN SHEARWATER.—Several shearwaters, presumably of this species, were seen just before entering Nassau harbor.

3. *Oceanites oceanicus* (Kuhl)? WILSON'S PETREL.—Small black petrels followed the vessel in some numbers from the time we passed out of Chesapeake Bay until after we sighted the Nassau light and on the return voyage, but in smaller numbers, soon after we left Abaco until we sighted the Capes. We watched these birds with considerable interest and observed that the feet were carried close together and straight out behind in flight, giving the impression of a longer central tail feather. The wings appeared to have a V-shaped piece taken out of them, where the long primaries meet the secondaries, I presume. In hovering to examine anything or to check their flight they drop the feet into the water and appear to be walking on the waves, but this is only for a brief period, as a rule, when they resume their course. Occasionally they were seen to settle on the water but for a short time only.

4. *Phaëthon americanus* Grant. AMERICAN TROPIC BIRD.—Several tropic birds met the vessel the day before we reached Nassau and quite a number came around the vessel after leaving Abaco. They were very bold and one seemed inclined to alight on the rigging.

5. *Phalacrocorax vigua mexicanus* (Brant). MEXICAN CORMORANT.—A colony of these cormorants was breeding in some tall mangroves in the large salt water lake on Watlings Island. Most of the young were found

¹The Bahama Islands. Published by the Geographical Society of Baltimore. 1905. George Burbank Shattuck, Ph. D., Editor. Birds, pp. 347-368. [Cf. Auk, XXII, July, 1905, p. 328.]

sitting on the edge of the nests, that were from fifteen to twenty feet up, or on the limbs out of the nest. Some of the young were already in the water with their parents, though they could not fly apparently. A few nests contained heavily incubated eggs. This was on July 11. A few cormorants were seen on the salt pans around Clarence Harbor, Long Island, but as none were shot here their identity is in doubt, though they appeared to belong to the same form as those shot on Watlings. The young are eaten by the inhabitants and are said to be very good. The numerous downy skins found along the shores of the salt lakes on Watlings, would indicate that young cormorant is quite an item in the domestic economy of the islanders.

6. *Fregata aquila* (Linn.). MAN-O'-WAR BIRD.—Man-o'-War Birds were seen in greater or less numbers at New Providence, Eleuthera, Cat Island, Rum Cay, Watlings Island, and Abaco. We were much interested in watching a Laughing Gull, early one morning, making repeated swoops at some object floating in the water, when one of these birds came silently up and carried off the booty without an effort, much to the discomfiture of the gull. In flying or sailing, which seems to be done without an effort, the tail is carried closed as a rule.

7. *Phœnicopterus ruber* Linn. AMERICAN FLAMINGO.—Not uncommon and breeding on Grassy Creek, Andros. Though we did not reach the nesting grounds, on account of the very short time allotted us to make the trip, we saw the birds in the distance in a long red line and were told that they were nesting there. One that was feeding in a shallow part of the swash, and on which we succeeded in stealing up to within a hundred yards, would put its head under water and then move the feet backward as if it was scratching up the mud to obtain food. In flight the head and feet are held in nearly a straight line with the body and the bird presents a very striking figure, like a pair of black-tipped wings, that appear inadequate for support, fitted to a long red line with a knot at the end where the head is situated. In all we saw a number of detached flocks and single birds, besides the main body in the distance, during the day we spent here, but the birds are very wary from continued persecution by the inhabitants and visiting sportsmen from Nassau. The country they inhabit is very difficult to hunt over, being mostly under water with small keys and mud flats here and there, and is locally called swash. We were told that late in the summer they moult all the flight feathers at once and are then pursued and captured by the inhabitants. A small colony, we were informed, breeds on the lake near Clarence Harbor, Long Island, but we did not have an opportunity of verifying this report.

8. *Herodias egretta* (Gm.). AMERICAN EGRET.—Several were shot on Grassy Creek, Andros. They were also seen on Eleuthera, Watlings Island, and Long Island, generally singly.

9. *Hydranassa tricolor ruficollis* (Gosse). LOUISIANA HERON.—Very common and breeding on Watlings Island, July 12. All the young seen were nearly, if not quite, able to fly.

10. *Butorides virescens bahamensis* (*Brewster*). BAHAMA HERON.—This light colored, well-marked form of the Green Heron was found in small numbers on New Providence, Andros, Eleuthera, Rum Cay, Watlings Island, and Long Island.

11. *Nyctanassa violacea* (*Linn.*). YELLOW-CROWNED NIGHT HERON.—This was a very common heron on Grassy Creek, Andros. A nest constructed loosely of sticks was built about eighteen inches above the ground in a bush on Grassy Creek. It was about two feet in diameter and contained two young nearly ready to fly and another young was found on the ground that had evidently left the nest, June 29. Some birds shot from a cliff on Eleuthera had the bills coated apparently with carrion. It was also seen on Watlings and Long Islands.

12. *Poecilonetta bahamensis* (*Linn.*). BAHAMA DUCK.—Three ducks, apparently of this species, were seen on Grassy Creek, Andros. One was shot and several others seen on Long Island, July 17. The specimen shot was a female and refused to fly, indicating that she had a nest in the near vicinity, but though we searched for a long while, our efforts were futile. Upper mandible bluish slate, with an ochraceous yellow blotch on each side near the base, in life.

13. *Colinus virginianus bahamensis* (*Maynard*). BAHAMA BOB-WHITE.—Though often heard and seen on two or three occasions crossing the roads on New Providence, we did not succeed in securing any specimens. We found it impossible to make them rise in the thick brush. They are said to have been introduced by one of the early plantation owners, which would seem to invalidate the claims of *bahamensis* to recognition.

14. *Rallus crepitans coryi* (*Maynard*). BAHAMA CLAPPER RAIL.—One was shot by Mr. Derickson on New Providence, June 24. A Clapper Rail was heard on Grassy Creek, Andros, and another on Eleuthera. These rails keep to the mangroves and it is impossible to flush them. The one taken was only shot after an hour or two's work by both of us, and then only after we had kept still for a time. They skulk under the roots and only those who have been in a mangrove swamp can appreciate the difficulty of trying to make them rise; occasional glimpses can sometimes be obtained as they glide from clump to clump. They are noisy and make their presence known, however.

The specimen taken, when compared with the forms of Clapper Rail inhabiting the West Indies, is much lighter in color, but from true *crepitans* of the northeastern United States it is hardly different, being only slightly lighter in color with an apparently shorter and slenderer bill.

15. *Larus atricilla* *Linn.* LAUGHING GULL.—Laughing Gulls were seen in small numbers at New Providence, Andros, Eleuthera, Rum Cay, Watlings, and Long Islands.

16. *Gelochelidon nilotica* (*Linn.*). GULL-BILLED TERN.—Two or three were seen hawking over a clearing on Eleuthera; about a dozen were found frequenting a small inland lake on Rum Cay; and they were not uncommon around the old salt pans on Long Island.

17. *Sterna maxima* (*Boddaert*) ROYAL TERN.—A fine specimen was shot by Dr. Penrose and a few others were seen on Andros; a few were seen around Eleuthera and Long Island.

18. *Sterna sandvicensis acuflavida* (*Cabot*)? CABOT'S TERN.—A large tern with an apparently yellow-tipped bill was seen sitting on a buoy as we entered Nassau, June 17; I take it to be of this form.

19. *Sterna antillarum* (*Lesson*). LEAST TERN.—This species was breeding in some numbers on Little Mangrove Cay, Andros; they were also seen in small numbers around Eleuthera, Rum Cay, Watlings Island, and Abaco.

20. *Sterna anæthetus Scopoli*. BRIDLED TERN.—A few were shot at Mangrove Cay, Andros; they were apparently breeding in immense numbers on a small key just back of Governor's Harbor, Eleuthera, July 7, where we shot a number. A few were seen opposite Elbow Cay, Abaco.

21. *Anous stolidus* (*Linn.*). NODDY.—One was seen between Andros and Green Cay, June 30.

22. *Himantopus mexicanus* (*Müller*). BLACK-NECKED STILT.—One was seen on Grassy Creek, Andros; they were not uncommon on Eleuthera, Rum Cay, Watlings, and Long Islands. They are very noisy, circling around the invader of their haunts and keeping up a continuous racket. On this account they are known as *tell tales*. Almost every small pond or inland mud flat seemed to have a few pairs wading around with stately tread until the intruder was sighted when their infernal racket began.

23. *Actodromas minutilla* (*Vieillot*). LEAST SANDPIPER.—A flock of seven was found on Long Island, July 16, and several taken.

24. *Catoptrophorus semipalmatus* (*Gm.*). WILLET.—Very common on Grassy Creek, Andros, where a young specimen was taken by Mr. Derickson on which the feathers were just beginning to appear, June 29. A set of four heavily incubated eggs was taken by Mr. Mooney at Mangrove Cay, Andros, June 27. A few pairs were found around a small pond on Rum Cay, and several were seen in a similar situation on Long Island.

Our specimens appear to be smaller than *semipalmatus* from the eastern United States with shorter and slenderer bills.

25. *Oxyechus vociferus* (*Linn.*). KILLDEER.—A single specimen was flushed, but not secured, on Cat Island, July 9.

26. *Ægialitis semipalmata* (*Bonap.*). SEMIPALMATED PLOVER.—A single specimen was shot by Mr. Derickson on Long Island, July 17.

27. *Ægialitis nivosa* *Cassin*. SNOWY PLOVER.—A single specimen in worn plumage was shot and another seen by Mr. Derickson on Long Island, July 16, as reported in 'The Auk,' XX, 1903, 433.

28. *Ochthodromus wilsonius* (*Ord*). WILSON'S PLOVER.—Not uncommon on Andros; a pair were evidently nesting on Rum Cay, July 10; not uncommon on Long Island.

All the birds taken seem to be paler and smaller than specimens from the eastern United States, but are nearer *wilsonius* than *rufinuchus* of the West Indies.

29. *Hæmatopus palliatus* *Temminck*. AMERICAN OYSTER-CATCHER. — Two were seen standing on the rocks and one was taken on Long Island, July 17. Mr. Derickson saw three or four additional specimens near the same place but was unable to secure any.

The characters assigned to *prattii* do not appear to be constant and hardly seem to warrant separation. I say this after comparing three specimens from the Bahamas with a series of *palliatus* from various localities. Bill and ring around eye bright orange; irides gamboge, shot with brown.

30. *Columba leucocephala* *Linn.* WHITE-CROWNED PIGEON. — A female taken on New Providence, where they were not common, June 23, had an egg in the oviduct ready to be deposited. Thousands were seen flying, late in the evening, from Andros towards Green Cay, where there was a large breeding colony. Small flocks and single birds were seen on Eleuthera, Cat Island, Watlings, and Long Island. A nest was found on Abaco, July 22, about fifty feet up in a pine. It contained young, I judged, from the actions of the parents. Irides buff.

31. *Zenaidura macroura* (*Linn.*). MOURNING DOVE. — A male, apparently not different from birds from the eastern United States, was shot on Long Island, July 16.

32. *Zenaida zenaida* (*Bonap.*). ZENAIDA DOVE. — This dove was seen on New Providence, Eleuthera, Cat Island, Watlings, and Long Island. They were generally seen singly, flying back and forth, and on no island in any numbers. Dr. Coker showed me a nest, containing two young with the feathers just sprouting, on Long Island, July 17. The nest was quite an elaborate affair for a dove, composed of small twigs and placed in a small cavern of the rough coral rock of the beach.

33. *Columbigallina passerina bahamensis* (*Maynard*). — BAHAMA GROUND DOVE. — This well-marked form of Ground Dove was abundant in clearings or along the roads on New Providence, Eleuthera, Cat Island, Watlings, and Long Island, but not very common on Abaco where we landed. Bill (in life) black, except at base of lower mandible where it is reddish.

34. *Cathartes aura* (*Linn.*). TURKEY VULTURE. — Quite a number were seen on Andros, where they appear to be not uncommon.

35. *Pandion haliaëtus ridgwayi* (*Maynard*). BAHAMA OSPREY. — Several of this doubtful form of osprey were seen on Long Island and one was shot by Mr. Derickson, but not recovered.

36. *Speotyto cunicularia cavicola* *Bangs*. NASSAU BURROWING OWL. — A male shot on New Providence, June 19, was sent to me in the flesh by Mr. C. Hamilton Burnside.

This specimen when compared with *S. c. floridana* is apparently of a more reddish cast with larger and whiter spotting, and the spots on the

outer primary are less pronounced and do not reach the shaft of the feather by a considerable distance, producing an entirely different pattern. It is lighter in color than *S. c. dominicensis* and the pattern of the outer primary is different. I have not seen a specimen of *S. c. bahamensis* from Great Inagua.

37. *Crotophaga ani* Linn. ANI.—These noisy birds were common on New Providence, but rather rare on Eleuthera, Watlings, and Long Island.

38. *Coccyzus minor maynardi* (Ridgway). MAYNARD'S CUCKOO.—One was shot and another seen on New Providence; a single specimen was taken on Long Island.

39. *Saurothera bahamensis* Bryant. BAHAMA LIZARD CUCKOO.—A specimen was seen after a heavy tropical rain sitting in a dejected attitude with drooping wings, drying its plumage, and shot. A male, shot in worn plumage, July 20, is without the black subterminal bar on the tail, though apparently adult; this would seem to indicate that the fully adult plumage is not acquired until after a complete fall moult or until the second year. Though apparently not uncommon on New Providence (it was only observed there) it is more often heard than seen, as it keeps to the thick scrub. While its notes did not sound so loud or so varied as those of *S. merlini* of Cuba they have a general unmistakable resemblance. Bare skin around the eye vermillion; irides brown.

40. *Dryobates villosus maynardi* Ridgway. MAYNARD'S WOODPECKER.—Two females and one male of this small race of the Hairy Woodpecker were taken on New Providence, and about as many more were heard.

41. *Centurus superciliaris nyeanus* (Ridgway). NYE'S WOODPECKER.—For an account of the taking of a specimen of this woodpecker see 'The Auk,' XX, 1903, 434.

This only appears to be a well-marked race of *Centurus superciliaris* of Cuba, from which it differs in the following points: (1) smaller size; (2) smaller black superciliary patch; (3) lighter color, both above and below, with hardly any of the olive tinge so conspicuous in *superciliaris*; and (4) in having less red on the belly. Its nearest relative is probably *Centurus superciliaris blakei* of Abaco, from which it differs: (1) in being lighter in color; and (2) in not having so much olive below.

42. *Chordeiles virginianus vicinus* Riley. BAHAMA NIGHTHAWK.—I have nothing to add to my account of this bird already given in 'The Auk,' XX, 1903, 431.

43. *Doricha evelynæ* (Bourcier). BAHAMA WOOD-STAR.—This hummer was especially common on New Providence, where the females and immature males seemed to outnumber the adult males about ten to one. They were also seen on Andros, Eleuthera, Cat Island, Rum Cay and Long Island, but on none in such numbers as at Nassau. They did not appear to be as active as *Trochilus colubris*, and most of those seen feeding were hovering around spider webs. The greater part of their time seemed to be spent in resting, perched quietly in a conspicuous place.

44. *Riccordia riccordii æneoviridis* (Palmer & Riley). BAHAMA EMERALD HUMMINGBIRD. — The only hummer seen by us on Abaco, where it did not appear to be uncommon was of this race. It is much more active than the preceding species but I could detect no difference in habits from true *riccordii*.

Mr. Bonhote, in 'The Ibis,' July, 1903, 293, says that he sees no good reason for separation, but admits that the present form differs from *riccordii* in (1) the middle feather of Abaco birds being slightly broader, and (2) the tail of a more coppery bronze. I have examined our series of *riccordii* and *æneoviridis* again and find that the tail of Abaco birds is less deeply forked and that the middle tail feather is broader. Abaco birds average a more coppery green both above and below and I think the differences between the two birds are sufficient to keep them apart as geographical races at least.

45. *Tyrannus dominicensis* (Gm.). GRAY KINGBIRD. — Very common on New Providence, Andros, Eleuthera, Cat Island, Rum Cay, Watlings Island, Long Island, and Abaco. Does not appear to be as noisy as *Tyrannus tyrannus*, but it was by far the noisiest bird met with, with the exception of the Black-necked Stilt and the Willet. A nest, with three heavily incubated eggs, was placed in a small mangrove about five feet above the water on a small bay near The Bluff, Eleuthera, July 4. Another nest was found in a slender dead tree on Long Island, July 14. It was about fourteen feet above the ground and out on a slender branch. We could not reach the nest but could see that it contained eggs. One of the parents of this nest was very bold, darting down almost into my face while I was trying unsuccessfully to reach the eggs. A nest was seen on Abaco, July 22, about fifty feet up in a pine, that, judging from the actions of the parents, must have contained young on this date.

A male shot on Eleuthera, July 6, has the bill, almost if not quite, equal to some specimens of *T. d. rostratus*, but it is slightly more attenuate at the end.

46. *Pitangus bahamensis* Bryant. BAHAMA PITANGUS. — Found only amongst the pines on New Providence, where they were by no means common. They did not seem to be as noisy as *Pitangus caudifasciatus* of Cuba, and the white at the base of the tail is not nearly so conspicuous in flight.

47. *Blacicus bahamensis* (Bryant). BAHAMA PEWEE. — An immature male was shot on New Providence, June 19, amongst the pines. One was noticed on the border of the pines on Abaco, July 22, but not secured. No others seen.

48. *Mimus gundlachi Cabanis* GUNDLACH'S MOCKINGBIRD.

49. *Mimus gundlachi bahamensis* (Bryant). BRYANT'S MOCKINGBIRD. — Very common on Andros, Eleuthera, Cat Island, Rum Cay, Watlings Island, and Long Island. Not as good a songster as *polyglottos* nor are the notes so varied. Numerous unoccupied nests were seen on Eleuthera in the orange trees about four feet up. Mr. Derickson found a nest on

Eleuthera, July 6, and caught the parent alive with his hand on the nest. The nest contained three heavily incubated eggs with a creamy white ground, covered rather evenly with small spots and streaks of two shades of vinaceous. They measure 28.3 by 20.4, 28.5 by 20, and 28.5 by 20.4 mm. respectively.

Gundlach says (Orn. Cubana, 1895, 53) that the type of Cabanis's *M. gundlachi* came from the Cayo Santa Maria, off the northern coast of Cuba, where it was probably a straggler, as Gundlach apparently did not meet with it again in a wild state. Mr. Ridgway has discriminated two forms, a northern and a southern. Bryant's name applies to the northern form.

50. *Margarops fuscatus* (Vieillot). PEARLY-EYED THRUSH.—Not uncommon on Rum Cay and Watlings Island, but much rarer on Long Island. These birds keep to the thick brush and are rarely seen in the open, but they have a beautiful song, much superior to that of *Mimus gundlachi*, which makes their presence known. They appear to be very shy and dart to cover at the least alarm if they happen to be away from it. One was seen in hot pursuit of a Gray Kingbird on Rum Cay that seemed only too glad to escape by flight. Irides yellowish-white.

51. *Mimocichla plumbea* (Linn.). BAHAMA RED-LEGGED THRUSH.—Found sparingly on New Providence, Eleuthera, and Cat Island. Keeps to the thicker cover and is rarely seen. Sings perched in the top of the taller trees, and while the song is not bad, it is far inferior to that of *Margarops*. A nest, composed of palmetto strips and rootlets, was found, July 7, on Eleuthera, about seven feet from the ground in the crown of a paw-paw tree. It contained three young just from the egg. The local name for this thrush is "Blue Thrasher" and on Cat Island "Blue Jay." Tarsi and ring of skin directly around the eye, coral red.

52. *Polioptila cærulea cæsiogaster* Ridgway. BAHAMA GNATCATCHER.—A male was 'squeaked up' and shot on New Providence, June 19, in the pines. After shooting the male three young barely able to fly were discovered, and though I waited around for some time and returned to the same place next day, nothing was seen of the female.

53. *Vireosylva calidris barbatulus* (Cabanis). BLACK-WHISKERED VIREO.—Common on New Providence, Eleuthera, and Long Island. Has a monotonous song resembling that of *V. olivaceus* but is probably on the whole better.

54. *Vireo crassirostris* (Bryant). BAHAMA VIREO.

55. *Vireo crassirostris flavescens* Ridgway. YELLOW BAHAMA VIREO.—Vireos of either one or the other of these forms were rather common in the thick brush on all the islands visited. In habits and song they resemble *Vireo noveboracensis*, but the notes are more varied and of endless variety. One of the commonest notes heard sounds something like *chip-cheree*. The irides are brown. Our specimens are either *crassirostris*, *flavescens*, or intermediates, and seem to throw no light on the status of the two forms, as the following list of specimens will show:

Vireo crassirostris.—New Providence, 10; Abaco, 2. *Intermediates*.—New Providence, 3; Eleuthera, 2; Cat Island, 1; Rum Cay, 1; Long Island, 4. *Vireo c. flavescens*.—Eleuthera, 5; Long Island, 2.

56. *Callichelidon cyaneoviridis* (Bryant). BAHAMA SWALLOW.—We found these birds only along the road west of Nassau, New Providence. On cloudy days they would come out in force and hawk about the cliffs and open fields; when it was clear we could hardly find a bird. They are very graceful in flight and the forked tail of the adult is then very conspicuous, reminding one at a distance of the Barn Swallow. The tail of the immature is not very prominently forked and the iridescent color of the adult is lacking; in this plumage resembling young of *Iridoprocne bicolor*. On July 2, we saw twelve of these swallows sitting in a row on the eaves of the Colonial Hotel, the only time we saw any of them perched.

57. *Dendroica petechia flaviceps* Chapman. BAHAMA YELLOW WARBLER.—Common in the mangroves near the beach on Rum Cay; a few were found along the shore on Watlings Island. Like *D. p. gundlachi* in Cuba, this bird does not appear to be found far away from mangrove swamps.

58. *Dendroica dominica* (Linn.). YELLOW-THROATED WARBLER.—Two taken in the pines on Abaco, July 22, would seem to indicate that this species is resident.

59. *Dendroica pityophila bahamensis* Cory. BAHAMA WARBLER.—A young specimen was shot by Mr. Derickson in the pines on Abaco, July 22. As the young plumage has never been described, a description is given.

Above hair brown; breast and flanks lighter hair brown; throat, center of belly, and under tail-coverts whitish; tail blackish, the inner web of the outer feather with an oblique white spot, this spot barely indicated on the next; feathers of the wing blackish, slightly edged with hair brown; the greater and lesser coverts slightly tipped with drab.

60. *Dendroica vigorsii achrustera* (Bangs). NASSAU PINE WARBLER.—Not uncommon in the pines on New Providence.

61. *Dendroica vigorsii abacoensis* Ridgway. ABACO PINE WARBLER.—One taken in the pines on Abaco, July 22.

62. *Dendroica discolor* (Vieillot). PRAIRIE WARBLER.—One specimen in immature fall plumage taken on New Providence, July 20, was probably bred on the island.

63. *Geothlypis maynardi* Bangs. MAYNARD'S YELLOW-THROAT.—A male taken on New Providence, June 18, has the back and top of head much more yellowish olive-green than any specimen of *maynardi* available for comparison, but is nearer this species than *flavida*. It is also of a brighter yellow below with an apparently heavier bill than specimens of *maynardi* in the collection.

Yellow-throats are apparently rare on New Providence and only three or four were heard during our stay of a little over a week.

64. *Geothlypis tanneri* Ridgway. TANNER'S YELLOW-THROAT.—A male was taken amongst the pines on Abaco, July 22.

65. *Geothlypis incompta* *Ridgway*. LESSER ABACO YELLOW-THROAT. — A male taken on Abaco, July 22, in worn plumage, while paler both above and below than any specimen of *incompta* available for comparison comes nearer to this than it does to *tanneri*.

During the four hours we spent on Abaco, we took two male yellowthroats and saw a female we did not succeed in shooting. This would indicate that they are not uncommon on the island. Both this and the above species were taken in the same character of country, namely heavy pine forest with *Pteris* fern brake beneath. The specimen of *tanneri* taken was singing a song somewhat resembling the well-known notes of *G. trichas* but probably with more force. It was easily 'squeaked up,' coming almost too close to shoot even with a light load in an insertion barrel, but backing off is out of the question in a rocky fern brake full of holes and crevices.

66. *Cœreba bahamensis* (*Reich.*). BAHAMA BANANAQUIT. — Abundant on New Providence, Andros, Eleuthera, Cat Island, Rum Cay, Watlings Island, Long Island, and Abaco. One of the first birds to respond to squeaking. They seemed to be very industrious in searching the trees, presumably for insects, crawling up and down like *Mniotilta varia*; indeed, their actions are very warbler-like. Their song is a weak little warbler-like trill. Several dome-shaped nests that we took to belong to this species were found but none contained eggs. Young in all stages of plumage were seen, indicating that the nesting season for them was apparently over. The skin at the angle of the commissure is coral pink in life.

67. *Agelaius phœniceus bryanti* *Ridgway*. BAHAMA REDWING. — A few pairs were found around Lake Kilarney and a small mangrove swamp on the western end of New Providence. Two nests, like the nests of the common Redwing, were found in the latter situation, June 24. The nests were in small mangrove bushes, about four feet from the ground, and contained three young and three eggs respectively. The eggs do not differ materially from eggs of *A. phœniceus* and measure 23 by 17.5, 23.2 by 17.7, and 22.2 by 17 mm. A few pairs were seen on Grassy Creek, Andros, and a few pairs around a small mangrove swamp on Abaco.

Our New Providence specimens seem to be slightly darker than our Abaco (the type locality of *bryanti*) birds, but our series from either island is too small to be of any importance.

68. *Spindalis zena* (*Linn.*). BLACK-BACKED SPINDALIS. Very common on New Providence and Long Island. They could often be seen on New Providence floating over the low scrubby growth and singing on the wing, though their song is generally delivered whilst perched, and I suppose the aerial evolution is only resorted to when their nuptial passions can no longer be restrained. The song is a weak little trill and does not take high rank as a musical performance. I came upon four or five of these birds one day feeding greedily upon the ripe fruit of the sapodilla.

69. *Spindalis zena townsendi* Ridgway. ABACO SPINDALIS.— This well-marked race was common amongst the pines on Abaco, and though we shot a number, only succeeded in recovering two that would do for specimens.

70. *Pyrrhulagra violacea* (Linn.). BAHAMA BULLFINCH.— Very common on New Providence, but seen in far less numbers on Eleuthera, Cat Island, and Long Island. Keeps to the thick scrub and is rarely seen, but is one of the first birds to respond to squeaking.

71. *Tiaris bicolor* (Linn.). BAHAMA GRASSQUIT.— Abundant on New Providence, Eleuthera, Cat Island, Watlings Island, Long Island, and Abaco. It has a sweet little weak song that somewhat reminded me of the Field Sparrow's. This song is generally delivered from a low bush but occasionally from the tops of the taller trees. It frequents the scrubby growth, keeping near the ground, as a rule.



ARE THE HABITS OF BIRDS CHANGING?

BY GEO. F. BRENINGER.

CHANGES in the habits of birds are largely due to conditions; conditions change with the progress of time. A century ago there were many large areas of timbered lands; these are being gradually cut away, until to-day there are but few large timbered tracts within the boundaries of the United States, and these principally in the West. With the felling of the trees and the clearing away of the smaller growths, follows the plowman; seed is sown, and changes take place, which attract some species and drive others away. The nesting habits in many species change.

During the past twenty-five years I have seen changes in nesting sites in many species, notably with Lucy's Warbler (*Helmintophila luciae*). Normally this warbler nests in natural cavities in the trunks of trees. My observations lead me to believe the mesquite to be the kind of tree selected, though in a measure this is again due to conditions. In the land where Lucy's Warbler lives mesquite is the principal tree. Cottonwood is also

used, but after all, its the 'hole' that is selected and not the tree, be it mesquite, willow or a fence post. I have seen probably a hundred instances of the nesting of this warbler. I find that the majority were in natural cavities in dead parts of living trees — woodpecker cavities in trees and fence posts. The next greatest number place their nests behind pieces of loose bark. In later years we find them appropriating old and abandoned nests of the Verdin (*Auriparus flaviceps*) and other species. In one instance I saw a thrasher's nest used. The warbler had built its nest within the cavity of the larger nest. In still another instance a warbler had built its nest in a hole in a bank of earth. The height of surprise was reached in an open nest built among the smaller limbs of a mesquite tree. The material used in its construction was of mesquite leaves and stems lined with horse-hair, the same as is used in a cavity.

These unusual nesting sites were mostly noted in the vicinity of Tucson, Arizona, where the larger trees had been cut away, and with them all the holes used in former years, and in consequence thereof certain species of birds are forced to adopt other nesting sites and methods of nest building.

Another instance is that of the Ash-throated Flycatcher (*Myiarchus mexicanus magister*). Not capable of cutting its own nesting cavity, it preëmpts those cut by other species, chiefly woodpeckers. With the destruction of the larger trees, *Myiarchus* is forced to look elsewhere for a location. Unusual among nesting sites of this species is one in a tree yucca, the hair-lined nest being built among the hanging leaves close to the trunk, where the sitting bird could look out upon the world through the lattice work of dry leaves. Another instance is where a pair made their home in a barn, the eggs being deposited in a nest of hair built on a cross beam on the side of the barn. Entrance was gained through a hole cut by a Flicker.

Every one is familiar with the swallow's nest beneath the eaves of the house, both of Cliff Swallows (*Petrochelidon lunifrons*) and Barn Swallows (*Hirundo erythrogastra*), and to-day few people can tell of seeing nests of Barn Swallows in any other place than under the protection of some of man's structures. In the case of the Cliff Swallow, many colonies still cling to the primitive method

of placing the nest on some overhanging rock or bank of clay. In sections of country where houses are few or entirely absent, both species nest on the face of a rock. Such places are rare, for wherever there is inducement enough to offer a home for the swallows, there is enough for man. With the advent of man, a house follows, and the swallows are not long in finding it.

Down in Mexico I saw both extremes, proximity to man, and where man was absent. In the ancient town of Tuxpan, State of Jalisco, I saw numerous instances of Barn Swallows nesting in the living rooms. In the unsettled portions of the State of Chihuahua, a hundred miles back from the railroad on one of the large 'haciendas'—a region devoid of the time-honored 'adobe'—Barn Swallows still nested on the rocks.

Throughout the eastern part of the United States Flickers (*Colaptes auratus*) frequently take up their abode within buildings, entering by way of holes cut by themselves. In the west the Red-shafted Flicker (*Colaptes cafer collaris*) has taken up the same habit, only to a less extent, due to the less pressing need. How conspicuous are the woodpecker holes in telegraph poles in some sections of the country! Here a little investigation will soon reveal that the large trees have been removed, and that the poles offer a better nesting site than anything left standing in the woods. Along the railroad between Benson and Bisbee, Arizona, the telegraph poles and fence posts show evidence of the work of woodpeckers, all by the Texan Woodpecker. Throughout this region trees are few, and the woodpeckers are forced to use anything that is dead and large enough to permit of a nesting cavity being excavated in it. Dead stalks of the century plant are often used. About Phoenix, Arizona, this woodpecker is common, timber suited to their needs is still in abundance, and the poles along the railroads and elsewhere are untouched. In some parts of Mexico the work of woodpeckers on telegraph poles has reached the stage of a nuisance, and a source of much outlay of money to keep the line in repair. Over a piece of road running between San Luis Potosi and Tampico the nuisance has become so great that the management threatened to dip the poles in a solution of creosote.

House Finches (*Carpodacus mexicanus frontalis*) readily accept any change offered, in this being a close second to the English

Sparrow (*Passer domesticus*). On San Clemente Island, Cal., they make free use of the sheep sheds. In others parts of California nests are commonly placed in the flowering vines over the doorway or in some choice flowering shrub, the birds amassing an unsightly bunch of rags, twine and hair. In Phoenix, Ariz., they are persistent in using the arc lights in various parts of the city. This species adapts itself admirably to changed conditions, adopting these by choice, not by need.

A THIRD TRIP TO THE HIGH SIERRAS.

BY MILTON S. RAY.

My brother, William R. Ray, and I, with our double team and camping rig, which has seen a thousand miles of service, departed at noon June 6, 1903, on the steamer which takes one as far as Eagle Point on the Sacramento River. The wealth of lower zone bird life here, in the lowlands along the river, must be seen to be appreciated, and the morning chorus from the willow thickets and marshy meadows is a revelation, imparting to the region a certain attractiveness which it lacks in most other respects.

June 7.— We arrived at Eagle Point at 5 o'clock A. M. and started immediately on going ashore. The weather had been extremely warm and the temperature was 106° in the shade at 8 o'clock this morning. We followed the level valley road through Sacramento to Folsom, which lies in the foothills on the American River, and halted five miles east of the latter town.

June 8.— In order to avoid the scorching heat we resumed our journey in the early hours this morning and traveled by the light of a full moon. Several miles from the starting place we discovered what appeared, in the uncertain light, to be a coiled rattlesnake. On nearer approach, however, the object took flight disclosing two small young, and proved to be a Dusky Poor-will

(*Phalacroptilus nuttalli californicus*). The nearly full-fledged young were on the bare ground and only two feet from the road over which much teaming is done. Between Folsom and Placerville we found the Yellow-billed Magpie (*Pica nuttalli*) very abundant and noticed many nests, all placed near the top of tall oak trees. Eleven o'clock brought us to Placerville and ended the day's travel.

June 9.— To-day we journeyed as far as Slippery Ford, on the headwaters of the American River. The drive was through a continuous woodland, uniform in character and beauty, and quite unlike the stern, rocky, precipitous country of the higher altitudes.

June 10.— Our experience to-day will be long remembered. Thinking that even if snow should cover the road, we could reach Forni's, at the base of Pyramid Peak, we left the main highway at Georgetown Junction at noon and began the ascent by a steep road used only by dairymen in the late summer. Many fallen trees, the work of winter storms, lay across the road, and much accumulated brush impeded our progress, which even at the best was slow. We felt rewarded for our efforts, however, when we reached the summit, where the willows were only in bud and the grass on the meadows just peeping out. Numberless Chickadees were flitting about, besides various other species of bird life. Our elation was short-lived, however, for a blinding rain-storm, ushered in with terrific thunder and lightning, soon made dismal the merry sun-lit woods. Indeed, what is more cheerless than a cold, dripping forest? After a while the rain ceased and we proceeded on our way, but soon the deep snow made the road impassable, and we were compelled to unharness the horses, packing only the necessities on their backs, in order to continue. In places small streams had undermined the snow, in which the horses would sink deep, shifting the pack in their efforts to right themselves. Half a mile of this disheartened us and we turned back; but when we reached our wagon we found we were unable to turn it on the narrow road-bed. Not having eaten since breakfast, and being wet and cold, we were indeed in a sorry plight. After unloading the wagon we finally succeeded, inch by inch, in turning it around, and a mad ride down the grade brought us again to Georgetown Junction; and a few miles further on we reached Echo, where we built a

roaring camp fire and dried our outfit. Echo lies at the foot of the high granite cliffs of the summit, a vast area of virgin forest, full of surprises for the ornithologist.

June 11.—After due deliberation, this morning, we decided to press on to Lake Tahoe, and so began to climb up the winding road that leads to Phillip's Station, which came in sight at noon. We flushed a Sooty Grouse (*Dendragapus obscurus sierræ*) along the road, and in a pine stump, ten feet up, I found a nest of the Red-shafted Flicker (*Colaptes cafer collaris*) with six nearly fresh eggs. Near camp I also found a nest of the Sierra Hermit Thrush (*Hylocichla aonolaschkæ sequoiensis*) in a tamarack, six feet up, with four fresh eggs. The nest is $3\frac{1}{2}$ inches across by 2 inches deep, composed externally of moss, grass and weed stems and lined with fine dry grass and leaves.

June 12.—This morning I located a nest of the Cabanis Woodpecker (*Dryobates villosus hyloscopus*) in a tamarack stump, six feet up. Fine bits of wood, dislodged in excavating, were the only lining for the four eggs, in which incubation had begun. One of the parents was collected with this set. I also discovered to-day two more nests of the Hermit Thrush; one, in a small tamarack, held two fresh eggs, and the other, also in a tamarack, eight feet up, held three fresh eggs. The latter was at the head of a narrow cañon. Near by a brook of snow water flowed past, and below the nest the snow was three feet deep. The nest itself was a very beautiful one, being outwardly made of a very bright yellowish green moss which clings to the bark of the older trees in these high altitudes. I closed the day with a find, ten feet up, in a small tamarack by the roadside. The compact, well-feathered nest contained five richly marked and nearly fresh eggs, and on the return of the anxious, but gayly attired owners, I entered *Dendroica auduboni* in my note-book.

While on the summit, where both the Sierra Hermit Thrush (*Hylocichla aonolaschkæ sequoiensis*) and the Russet-backed Thrush (*Hylocichla ustulata ustulata*) occur, although the latter but sparingly, I had the first opportunity for a comparison of their songs. That of the Hermit Thrush is clear and ringing, like a merry brook of snow-water in the open; that of the Russet-back, indistinct yet sweet, like some whispering stream overhung

with heavy foliage. Almost everyone remarks the song of the Hermit,—gay, loud and far reaching; only an ornithologist, perhaps, would hear that of the Russet-back,—sad, subdued and mysterious. While the song of the Russet-back is far less loud than that of its rival yet, being more ventriloquial, it can be heard equally as far away. In the fading light, when most other birds are silent, these two peerless singers hold forth, and the effect is further enhanced by the beauty of the Sierran woodland and the stillness of the twilight hour.

During my stay at Phillip's Station I made the following list of species, which refers to this trip only. The summit here is not very extensive, being walled to the north and south by the higher mountain ridges. The elevation, 7500 feet, is about the same as that of the great Pyramid Peak Plateau.

List of Species.

1. *Oreortyx pictus plumiferus*. MOUNTAIN PARTRIDGE.—Common, breeding, but no nests were located.
2. *Dendragapus obscurus sierræ*. SIERRA GROUSE.—One seen, as noted above, and a few heard.
3. *Accipiter velox rufilatus*. WESTERN SHARP-SHINNED HAWK.—Seen several times.
4. *Dryobates villosus hyloscopus*. CABANIS WOODPECKER.—Rather abundant; one nest found, as previously stated.
5. *Colaptes cafer collaris*. RED-SHAFTED FLICKER.—Rather abundant; one nest found, as already noted.
6. *Selasphorus rufus*. RUFOUS HUMMINGBIRD.—A few seen.
7. *Nuttallornis borealis*. OLIVE-SIDED FLYCATCHER.—More often heard than seen.
8. *Contopus richardsoni richardsoni*. WESTERN WOOD PEWEE.—Rather common.
9. *Cyanocitta stelleri frontalis*. BLUE-FRONTED JAY.—Very scarce this year, for some reason.
10. *Carpodacus cassini*. CASSIN PURPLE FINCH.—Common.
11. *Zonotrichia leucophrys leucophrys*. WHITE-CROWNED SPARROW.—Common; one newly built nest found on the ground in a meadow.
12. *Spizella socialis arizonæ*. WESTERN CHIPPING SPARROW.—Common; just beginning to build; one nest with one egg noted.
13. *Junco hyemalis thurberi*. SIERRA JUNCO.—Common.
14. *Passerella iliaca megarhyncha*. THICK-BILLED SPARROW.—A few heard on the western edge of the summit.

15. *Piranga ludoviciana*. WESTERN TANAGER.— Abundant.
16. *Dendroica aestiva morcomi*. WESTERN YELLOW WARBLER.
17. *Dendroica auduboni*. AUDUBON WARBLER.
18. *Wilsonia pusilla pileolata*. PILEOLATED WARBLER.— All three species were noted.
19. *Sitta carolinensis aculeata*. SLENDER-BILLED NUTHATCH.
20. *Parus gambeli*. MOUNTAIN CHICKADEE.— Both seen and rather common.
21. *Hylocichla ustulata ustulata*. RUSSET-BACKED THRUSH.— A few heard and fewer seen.
22. *Hylocichla aonalaschke sequoiensis*. SIERRA HERMIT THRUSH.— Common; three nests with eggs found, as above noted.
23. *Merula migratoria propinqua*. WESTERN ROBIN.— Common as usual.

June 13.— We left Phillips Station at half past seven this morning and arrived at Bijou, on Lake Tahoe, at one o'clock in the afternoon. On the way, near the Sierra House, four feet up in a small tamarack by the roadside, I found another nest of *Dendroica auduboni*. The four eggs were well along in incubation and save for a few sparse blotches of deep lilac-gray, were unmarked.

June 14.— This morning I found near camp a third nest of the Audubon Warbler (*Dendroica auduboni*), fifteen feet up in a small pine. Incubation had just begun in the four eggs, which were typical. Of all the nests I have found of this warbler in this section none have been over twenty-five feet above the ground and most were under fifteen feet.

I took a ramble to-day along the edge of the marsh at Rowlands. The usual species were in evidence, and I noted the following nests: *Spizella socialis arizonæ*, three eggs, incubation begun; *Actitis macularia*, three eggs, fresh; *Hydrochelidon surinamensis*, nest on floating driftwood, two eggs, partly incubated.

June 15.— Outside of the usual species the only new bird I observed to-day was a Russet-backed Thrush (*Hylocichla ustulata ustulata*). This is the first one I have seen on the floor of the valley.

June 16.— We found a nest of the Mallard (*Anas boschas*) to-day in a wooded swamp. The nest was placed on one of the numerous and regular mounds, the origin of which I do not know, and the seven practically fresh eggs rested on a warm lining of

feathers and down. The nest measured seven inches across and was photographed.

On my first visit to Lake Valley, in 1901, I found, on June 11, on the shore of Rowlands Marsh, in a pine stump, a nest of the Western Bluebird (*Sialia mexicana occidentalis*) with five nearly fresh eggs. The parents being close at hand identification was made sure and as such I listed them in 'The Osprey' (Vol. V, No. 8). On my return to Lake Valley the following year I failed to find this species, which rather puzzled me, and I listed only the Mountain Bluebird (*Sialia arctica*) in my 'Land Birds of Lake Valley' (Auk, Vol. XX, No. 2). This year, however, I solved the puzzle. *Sialia mexicana occidentalis* occurs here but sparingly, being about one third as abundant as *Sialia arctica*, and, strange to say, does not frequent the habitations like the latter but nests deep in the woods, and well up on the mountain sides. It was in the latter location that I found a nest to-day, and intend to return to-morrow to collect the set with parent.

June 17.—I revisited the nest of the Western Bluebird (*Sialia mexicana occidentalis*) to-day and collected the eggs and male parent. The cavity, which was six feet up in a pine stump, was lined with the usual substances, and held six half-incubated eggs. This nest was located on the side of the mountain, about a mile southeast of Edgewood, which lies just over the state-line in Nevada.

On the way back considerable commotion about a nest of the Mountain Bluebird (*Sialia arctica*) in a tall dead tamarack attracted my attention. A chipmunk, intentionally or otherwise, had wandered up the tree trunk in close proximity to the nest-hole, and the angry owners, with bills and claws free, were giving him a grilling, while the chipmunk, needing his claws to cling to the bark, was helpless and forced to make an ignominious retreat. While the depredations on bird-life by this animal are said by some writers to be considerable, I am of the opinion that little harm is done to the bluebird family, who seem well able to protect their homes against this pest.

June 18.—To-day I rowed from Bijou to Rowlands Marsh, about two miles distant. Off shore at the latter place, in cavities in piles projecting above deep water, I found two nests of the

Tree Swallow (*Tachycineta bicolor*), both being warmly lined with feathers. One contained seven eggs well advanced in incubation, while the other held a single but unusually large egg, measuring .84 × .54 inches, which contained two perfectly formed embryos, the first instance of the kind I have found in eggs of wild birds. The specimen is elliptical oval in shape and has the same uneven patched effect noticeable in double-yoked chicken eggs.

I found that with the rowboat I was unable to reach many portions of the marsh that I visited in 1901 and 1902, when I had a light canvas canoe. While nothing particularly new was observed, the marsh with its great tern colonies (*Sterna forsteri* and *Hydrochelidon surinamensis*), the clattering crowds of blackbirds (*Agelaius phoeniceus neutralis*, *Xanthocephalus xanthocephalus* and *Euphagus cyanocephalus*) full of nesting troubles, the busy Killdeer, and Spotted Sandpiper (*Ægialitis vocifera* and *Actitis macularia*) practicing their deceptive tactics — running everywhere along the grassy shores except about their nests — and the various waterfowl, present a sight that is ever new and interesting to the naturalist.

June 19–25.— During this week I did little ornithological work except taking a female Nighthawk (*Chordeiles virginianus virginianus*) which contained an egg about to be laid. (This specimen, in the collection of the San Francisco Academy of Sciences, was identified by Mr. Leverett M. Loomis as above.)

June 26.— This morning a friend named Agnew and myself started for Star Lake, which we reached at noon and put in some time successfully fishing. Neither here nor on the way up did I notice anything new in the 'bird line.' Around the log cabin in which we are staying Clark Nutcrackers (*Nucifraga columbiana*) come in droves after the fish heads we have thrown out on the snow, which still lies deep on the ground.

June 27.— All forenoon Agnew was endeavoring to cook some beans, but the high altitude was against us. About noon we set forth, ascending the precipitous mountain side which rises above the southern end of the lake. Chopping into the snow to keep from slipping, clambering over masses of huge boulders, or threading our way along narrow ledges made the climb both laborious and dangerous. On reaching the main backbone of

the ridge a pair of Sharp-shinned Hawks (*Accipiter velox rufilatus*) flew out among the rocky crevices and hovered above, but I could not locate the nest. Following the ridge the ascent of Job's Peak and Job's Sister was made, and lastly Freel's Peak, which lies 10,849 feet above the sea level. We did not see any *Leucostictes* (*Leucosticte tephrocotis tephrocotis*) about the summits of these peaks, as we expected we would, but, strange to say, we observed near the top of Freel's Peak, and also further down on the broad patches of snow, a small dull-colored bird about the size of a Chipping Sparrow which we were unable to secure or identify.

The view from the top of Freel's Peak was magnificent, Hope Valley lying below on one side and Lake Valley and Lake Tahoe on the opposite. To the east was Nevada, with the fertile Carson Valley and countless ranges of barren mountains fading away in the dim distance. Surrounding Lake Tahoe and running in a northerly and southerly direction extended a never-ending line of snow-capped peaks rising above the heavy timber.

After spending some time running over the records of the Sierra Club, in the brass cylinder on the peak, we started for camp where we arrived about nine o'clock in the evening.

June 28.— We rested to-day from our trip. On the porch of the hotel a pair of Mountain Bluebirds (*Sialia arctica*) have their nest with young, and while we lounge around reading magazines the parents flit back and forth with provender for the juveniles, heedless of our presence.

June 29.— I found a dead male Lazuli Bunting (*Cyanospiza amœna*) near camp to-day.

June 30.— Cascade Lake was visited to-day but nothing appears in my note book. Late to-day, at Rowlands Marsh, a nest of the Cinnamon Teal (*Querquedula cyanoptera*), previously located, was visited and found to contain ten practically fresh eggs. It was well lined with down and placed among reeds on a narrow strip of land with deep water on both sides not far from the road. Further on in the sand bank which runs along the lake shore I noted a nest of the Belted Kingfisher (*Ceryle alcyon*) with large young.

July 1.— We left Bijou this morning for Carson City, Nevada,

which we made late in the afternoon. On the way, at Cave Rock — a tall bluff jutting out into Lake Tahoe—we noticed on a small rocky shelf the nest of a hawk containing young. The remains of several squirrels were observed hanging over the edge of the nest.

July 2.— We left Carson City this morning early. Bird life is abundant where there is any timber or meadowland but almost absent on the broad stretches of sage brush. In passing along Washoe Lake, on the road, we listed thirty different species, which is rather unusual for a drive of only about eight miles. We reached Laughton's Hot Springs, west of Reno, late this afternoon.

July 3.— We unexpectedly disposed of our team and outfit this morning in time to catch the ten o'clock overland train, which landed us in San Francisco at seven o'clock P. M., and brought the trip to a sudden ending.

The following additions were made to the list of the ' Land Birds of Lake Valley ' (*cf.* Auk, Vol. XX, No. 2).

110. *Buteo swainsoni*. SWAINSON HAWK.— A stuffed specimen of this species adorns the wall of the Custom House Saloon at Rowlands, where it was shot.

111. *Sialia mexicana occidentalis*. WESTERN BLUEBIRD.— Found breeding at various points in Lake Valley as above noted. While not uncommon, it is not nearly as abundant as *Sialia arctica*.

THE DIRECTION OF FLIGHT IN THE FALL MIGRATION AT NEW HAVEN, CONNECTICUT.

BY LOUIS B. BISHOP, M. D.

How birds find their way in their long journeys between their summer and winter homes is in a large part yet unsettled, and a recent writer on migration appears doubtful as to what degree they guide themselves by natural landmarks, such as coast lines and river valleys (Cooke, 'Some New Facts about the Migration of Birds'). It is in the hope of throwing a little light on this subject that I have brought together a few facts witnessed by myself regarding the flight of birds during the fall migration at New Haven. Mr. Brewster has shown that land birds collect in the fall migration at Point Lepreaux, New Brunswick, on their way south ('Bird Migration,' *Memoirs Nutt. Ornith. Club*, No. 1), and Dr. Merriam, the same fact regarding the Straits of Mackinac in the northward movement ('Bird Migration at the Straits of Mackinac,' *Auk*, Vol. II, p. 64); Mr. W. Eagle Clarke has studied the movement of birds past various English lighthouses (*Ibis*, 1902, p. 246, and 1904, p. 112, etc.), and Mr. Loomis, the migratory movements of water-fowl at Monterey Bay, California ('California Water Birds,' Nos. 1 to 5); but few continued observations of the direction of flight of land birds as they pass a given point some distance from the shore seem to have been placed on record. For several autumns past I have watched in the early morning on a number of different occasions the flight of migrants over a hill near New Haven, and give here in full the result of my observations in 1904, with the most important flights noticed in previous years.

To explain the peculiarity of flight witnessed it is necessary to give some description of the country around New Haven, and especially of the point where this migration was observed. The southern coast line of Connecticut, formed by Long Island Sound, runs nearly east and west, turning toward the southwest near New Haven, and a gap in it, extending about four miles due north and one to two miles broad, constitutes New Haven Harbor. At the northeastern extremity of the harbor the Quinnipiac River,

here about one quarter to one third of a mile in width, extends northward for about a mile. North of this stretch the Quinnipiac Marshes, almost a mile wide, with the river shrunk to modest proportions. West and north of the harbor, where the city is situated, the land is low and level, with few hills of any height within a mile of the coast. At the eastern entrance to the harbor and for about a mile into the interior the land is also low. There begins a series of parallel ridges of trap and sandstone, with valleys between, running north and south and gradually rising, but frequently broken by transverse valleys. Such a ridge, starting from the harbor at about a mile from its mouth and forming the eastern boundary of the Quinnipiac River where it is widest, extends a mile or more further north and broadens into a small tableland, elevated 150 to 250 feet above the surrounding country. This small, elevated plateau slopes gradually toward the east and south, a somewhat lower ridge parallel to the first extending from the southeastern corner, but descends abruptly on the west to almost the harbor level. Where the trap dyke broadens into the tableland a shallow pass exists, which the removal of the trees at this point has emphasized, this absence of trees giving a clear view of approaching migrants. Near here a wooded valley, lying between the two trap ridges, finds its origin. This point is about six and one half miles slightly east of north of the eastern entrance of the harbor, and about four miles from my home in New Haven, and here at the brink of the steep western slope the following notes were obtained.

Sept. 5, 1904.— Clear, cool, and calm; temperature 58° at 9 A. M.; following a day that was hot in the morning and cool in the afternoon with wind changing from north to south, after two hot days. Period of observation, 5 : 10 to 7 : 30 A. M. Many Warblers were heard flying over as I wheeled out and numbers were seen passing all the time I was on the hill, flying north or north-northeast, at 100 to 200 feet from the ground. A few small flocks of Bobolinks passed, flying high, northwest.

Sept. 6, 1904.— Clear and cool with north wind; 54° at 8 A. M. 5 : 15 to 7 : 30 A. M. Few birds seen; no migration.

Sept. 13, 1904.— Cloudy and cool with fresh north-northwest wind; 56° at 8 A. M.; after clear and hot day, following similar weather. 5 : 15 to 8 A. M. A great warbler migration, a constant succession appearing from the south and southwest and flying north and north-northeast, chiefly low

down, and many alighting and then hurrying on through the trees. All seemed to pass within a distance of one hundred yards east from the crest of the hill, as I saw very few further east and still fewer at the base of the hill on the west. This flight was in progress when I arrived and continuing when I left, but the largest number passed between 6 and 6:30. Black-and-white, Northern Parula, Magnolia, Black-throated Green, and Black-poll Warblers, Ovenbirds, Redstarts, Northern Yellow-throats and Wood Pewees were among the species noticed.

Sept. 16, 1904.—Clear, cold and calm; 49° at 8 A. M.; after two cool and showery days with fresh northwest winds. 5:20 to 8 A. M. A few Hawks flew west about 5:30. Warblers appeared at 5:35, and flew from south and south-southwest to north and north-northeast till 6:30; none seen flying at the base of the hill and none further east. A few Flickers appeared between 6 and 7.

Sept. 22, 1904.—Clear and cool with light north wind; 35° at 8 A. M.; after clear and cool day with fresh north-northwest wind, following cloudy, warmer weather. 5:40 to 8:15 A. M. About 20 Hawks passed flying west. A great flight of Flickers occurred between 5:45 and 6:30, these birds appearing chiefly from the south, alighting, and then flying down the hill north: birds in the air constantly, and often a dozen or more sitting in the trees at once. Also a few Phœbes and a number of Warblers flew north and traveled north through the tree-tops.

Oct. 1, 1904.—Clear and cool with light northwest wind; 53° at 8 A. M.; after warm and cloudy day with hard wind changing from south to northwest, following slightly cooler weather. 5:30 to 7:45 A. M. One Sharp-shinned Hawk flew west-by-south at 5:38; a few Warblers flew north at 5:47, and others flew into the tree-tops from the south later; a few Flickers appeared from the south between 5:50 and 6:30; and a small flock of Cowbirds flew south high in the air, probably from their roost in the Quinnipiac Marshes.

Oct. 7, 1904.—Clear and cold with light northwest wind; 35° at 8 A. M.; after a clear and cool but warmer day with fresh northwest wind, following similar weather. 5:40 to 8:30 A. M. A great migration of Warblers, Kinglets, Robins, Sparrows and Towhees, all flying or traveling through the trees and bushes north; a few Marsh and Sharp-shinned Hawks flew west; large flocks of Robins flew north between 5:50 and 7; and about 50 Flickers flew north. The bushes and trees were full of small birds as I climbed the hill, but none were seen or heard flying until 5:50, after which frequent flocks of Juncos, Warblers and Kinglets flew north and others traveled north through the trees and bushes. The road east and a brush-lot were full of White-throated, Song, and Field Sparrows and Towhees which flew before me along the road, none taking the first turn to the south, but many disappearing in the woods to the north, and most of the rest taking the first turning in the road to the north just beyond the woods.

Oct. 14, 1904.—Clear and cool with fresh north wind; 40° at 8 A. M.;

after a colder, cloudy day with fresh northeast wind, following warmer, stormy weather. 6:35 to 8:15 A. M. About 20 Flickers, and small flocks of Robins, Bluebirds, Juncos and Sparrows were seen flying north and others traveling north in the trees and bushes.

Oct. 17, 1904. — Clear, cool and calm; 39° at 8 A. M.; after two similar days. 5:45 to 8:30 A. M. Little migration. Several flocks of Bluebirds flew northwest or west-northwest between 6 and 7:30, high in air; a flock of Blackbirds flew west; Robins arising from the trees flew west and west-northwest; and a few Sparrows and Warblers flew north.

Oct. 22, 1904. — Clear, warm and calm; 53° at 8 A. M.; after hard southeast storm the morning before and stationary temperature. 5:55 to 7:45 A. M. No migration to speak of. Frequent straggling flocks of Bluebirds flew west or west-southwest all the morning, high in air; one flock of Robins and one of Cedar Waxwings flew west; and many Tree Swallows flew high, south, from 6:10 to 7:20, probably from the roost in Quinnipiac Marshes, all the later ones veering to the southwest and some to the west as they passed over-head, turning while I watched them.

Oct. 28, 1904. — Clear, cold and calm; 27° at 8 A. M.; after a rather windy, warm day, following still warmer weather, 6 to 7:45 A. M. Several flocks of Bluebirds flew west, high, between 6 and 6:30; a few small birds, chiefly Juncos, flew north at 6:20; and numbers of Robins flew low north and northwest from 6:30 to 7:30, many stopping.

In 1898 the early morning hours of Sept. 28, were spent at this spot; in 1900, the same hours on Sept. 19 and 20 and Oct. 11; in 1901, on Sept. 26, and Oct. 1, 4, 7, 11, 16, 25, and 30; in 1902, on Sept. 6, 11, 15, 18, 23, and 30, and Oct. 2, and 10; and in 1903, on Aug. 14, Sept. 4, 19, 21, 29 and 30, and Oct. 5, 14, 20 and 30; and the same general direction and manner of migration was observed. Of these dates, I give only the most interesting flights noticed.

Sept. 28, 1898. — Clear and warm; 58° at 8 A. M.; after a cool night and a rather cool, quite windy day. 6 to 7 A. M. About 15 Hawks, between 200 and 300 Flickers, and many flocks of Blue Jays, Tree Swallows, Robins, Bluebirds, Sparrows and Warblers appeared from the east and southeast and flew west and northwest.

Sept. 19, 1900. — Clear and cold, with light north wind; 46° at 4 A. M.; after clear, cool and windy day, following warmer weather. 5:20 to 7:30 A. M. Two Cooper's Hawks and 21 small hawks, chiefly Sharp-shinned, passed between 5:20 and 5:35, all flying high and swiftly west. About 6:30, 15 to 30 Flickers passed. All the morning Warblers and other small birds passed incessantly, appearing from the south and flying low, often from tree to tree, due north and down the hill.

Oct. 11, 1900. — Cool and clear, after two days of cold storm, following a week of hot weather. 5:50 to 7 A. M. About 15 Hawks passed over, flying west, and many small birds flew north.

Oct. 25, 1901. — Clear and cold with hard frost, after clear, cool and windy day, following warm weather. 6 to 8 A. M. Large flocks of Robins and Bluebirds flew north.

Sept. 15, 1902. Clear and cold; 49° at 8 A. M.; after clear and cool day, following warm weather. 5:30 to 7:30 A. M. A large migration of Warblers, all appearing from the southeast and flying northwest; very few stopping.

Oct. 2, 1902. — Clear and warm; 60° at 8 A. M.; after warm and occasionally stormy weather for a week. 5:45 to 7:30 A. M. Large flocks of Blue Jays appeared from the northeast and flew southwest, and a few Flickers appeared from the south and flew north.

Sept. 19, 1903. — Clear and cold, with moderate northeast wind; 51° at 8 A. M.; after a clear and cool day with fresh north wind, following a sudden drop in temperature. 5:25 to 8:15 A. M. A large migration of Warblers appeared from the south a little before 6, and lasted until 7, the birds coming from the south in twos and threes and dropping into the trees on the hill and flying north from tree to tree, and others continuing north without stopping; chiefly Black-poll and Black-throated Green. A number of Flickers and a few Sharp-shinned Hawks flew over from southeast to northwest between 6:30 and 7.

Sept. 29, 1903. — Clear and cold, with northwest wind; 44° at 8 A. M.; after a clear, cool and windy day, following warmer weather. 5:30 to 8:30 A. M. A great migration of Warblers, Kinglets, Sparrows, etc., flying north. Many Flickers and Blue Jays flew west or northwest from east or southeast.

Sept. 30, 1903. — Clear, calm and cold, with heavy frost, and fog in the valleys. 5:30 to 8:30 A. M. Many Flickers and Jays migrating; the former flying northwest and the latter, west and higher in the air.

Oct. 14, 1903. — Clear, calm and slightly cooler; 50° at 8 A. M.; after a clearing, warm day, following several days of northeast storm, but with little change in temperature. 5:40 to 8 A. M. No birds seen flying until 6 A. M. when a few Bluebirds flew high west, and 8 to 12 Sharp-shinned Hawks also flew west. Somewhat later a number of Juncos appeared from the south and stopped; and from 6:30 to 7:30 large numbers of Robins appeared from the south-southwest and stopped.

In the spring I have seen no flight of importance at this place, although I have been there frequently shortly after sunrise, and this is what might be expected from the surrounding country.

Although I have spent the same hours on many mornings each fall at other places near New Haven I have seen comparatively

few migrants in flight, and this is especially true of the mornings spent on a sandspit that bounds the western entrance to New Haven harbor, and where birds flying across the harbor would first reach land. At Guilford — about sixteen miles east of New Haven — large numbers of migrants, closely following the coastline, flew over me on Oct. 18, 1884, Oct. 24, 1892, and Aug. 2, 1894.

The temperature conditions governing migration were what was to be expected — that the greatest movement was on a cool morning following a sudden drop of temperature on the previous day; that there was no movement when the temperature was rising, and but little when it remained stationary; and that a fresh north wind did not seem to check the birds in their flight. Rather strangely it is under the same conditions alone that I have noticed here a bird-wave of any magnitude of transient visitors in the spring; for, although our summer residents appear after warm and southerly winds, those bound to more northern homes seem to stop only when a cold north wind bars the way.

To me among the interesting things shown by these mornings on the hill were, first, that these birds did not migrate past this point all night, the chief flight occurring between a quarter of an hour before sunrise and a half hour after; for although I might have heard a number passing the evening before, all was almost invariably silent as I bicycled the three and a half miles in the early dawn, and silent except for chirps from the trees and bushes as I climbed the hill. Usually I had to wait some time before the first migrants appeared, Crows being the first birds to begin their day's wanderings, and Hawks the first to pass in migration.

Another point was the manner of flight, Cedar Waxwings, Bobolinks, and Blackbirds being practically the only species to travel in compact flocks; the others moving in straggling companies, as Robins, Bluebirds, Jays, Warblers, Sparrows, Kinglets, and occasionally Flickers, or singly, as Hawks, Flycatchers, and usually Flickers.

As regards the height from the ground: Hawks, Jays, Bobolinks, Blackbirds, Swallows and Bluebirds usually flew several hundred yards in the air, and the others, seldom more than a gunshot from the ground. This last fact probably explains the directions of

flight. Long Island Sound must have been distinctly visible from the greater elevation, and from the lower only the Quinnipiac River and Marshes, and possibly New Haven harbor, and all at the greater height were flying west, and those at the lower, north. Interesting in this connection was the change in direction of flight from south to west observed in the Tree Swallows on Oct. 22, 1904, as the reed-beds on the Quinnipiac Marshes, where they had probably spent the previous night, are almost directly north, and the Sound would not have been visible until they reached the height of the hill.

To my mind the only explanation of the direction of flight so invariably noticed is that the birds flying west were guiding themselves by the coast line, and that those flying north, which includes most of the smaller species, had been deflected from their course by New Haven harbor. This they must have seen while flying west near the coast at a low elevation, turned north to avoid it, and followed up the valley east of the trap ridge, which led them to my post of observation.

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SUMMER BIRDS OF MOUNT PINOS, CALIFORNIA.

BY JOSEPH GRINNELL.

THE western portion of Ventura County, southern California, is occupied by an extensive mass of mountains fairly well marked off from other systems by intervening low divides. This mountain mass consists of irregularly arranged peaks and ridges interspersed with elevated valleys. Several of the latter are of large enough extent to warrant farming operations in wet years, but the sparse population is mainly centered around the Borax Mines. The highest peak of the group, Mount Pinos, is 8826 feet above sea level, according to the topographic map of the region recently issued by the U. S. Geological Survey. This peak, or rather, ridge, rises from a plateau of surrounding valleys themselves 5000 to 6000 feet in elevation, so that from wherever viewed, it does

not distinguish itself by conspicuous height. Mount Pinos is nearest the northern edge of this mountain system; in fact, the boundary line between Ventura and Kern Counties passes east and west over the summit.

From the summit an impressive view is obtainable interruptedly between the uneven saw-teeth of surrounding mountains: — to the north the southern San Joaquin Valley, with the Sierra Nevada range beyond; to the northeast the Tehachapi Mountains rising beyond Tejon Pass; to the eastward broad sand wastes of the Mojave Desert; on the southeast and south, a sea of mountains, the furthestmost on the horizon being the Sierra San Gabriel; an extremely precipitous tumble of mountains almost hides the ocean to the southwestward, but here and there bits of silver show its location 35 miles away; and to the west and northwest the low coast ranges fade away in the hazy distance.

On account of the comparative isolation, and especially the position of Mount Pinos in relation to the other mountain systems of California, I had long planned to visit it. For Mount Pinos lies at the convergence of three distinct lines of mountains, the coast range of central California, the Sierra Nevadas, which swing to the westward around the southern end of the San Joaquin Valley, and the Southern Sierras (San Gabriel and San Bernardino ranges). Yet it is constricted from the latter two, which are much higher than the coast range to the northward, by low divides. Faunally, as the material beyond enumerated demonstrates, the affinities of Mount Pinos and vicinity are with the Southern Sierras and San Diegan District, it thus marking the extreme northwestward extension of those faunal areas as far as now known to me.

On June 17, 1904, I left Pasadena by wagon to work over the Mount Pinos region for mammals, birds, and reptiles. Mr. Joseph Dixon, Assistant in Zoölogy at Throop Polytechnic Institute, accompanied me as field assistant. After a few days' loitering in the tree-yucca belt of Antelope Valley (the westward arm of the Mojave Desert), we entered the objective region from the east by the way of Tejon Pass and Cuddy Cañon, following the well-travelled road to the Borax Mines at the east base of Mount Pinos proper. We pulled up as high as we could, making perma-

nent camp at about 6500 feet altitude in Seymour Creek Cañon above the sawmill. This was our base camp while in the region, and from here we were within one to three hours tramp of all parts of the main mountain.

Owing to the excessive aridity of the region, perhaps accounted for by the ocean air-currents being cut off by intervening mountain ranges, the vegetation of the plateau region immediately surrounding Mount Pinos has a decidedly Great Basin aspect. The hills and lower mountain ridges up to about 6000 feet are abundantly clothed with piñon trees (*Pinus monophylla*) which seldom reach a height greater than 35 feet, and average over most of the region not more than 20 feet. The valleys are covered with sage (*Artemisia tridentata* and *Chrysothamnus mohavensis*) which lends a vivid similarity to the real desert. From 6000 feet up, the mountain itself is clothed with a generous growth of timber trees. For an interval up to 7000 feet on south slopes there is considerable brush consisting of a scrubby form of golden oak (*Quercus chrysolepis*), a manzanita (*Arctostaphylos patula*), and *Rhamnus tomentella*. This gives way at about 6000 feet on north slopes and 7000 feet on south slopes to open park-like forest, composed largely of the Jeffrey pine (*Pinus jeffreyi*). A good many yellow pines (*Pinus ponderosa*) occur on the lower slopes, often extending along water courses far down into the piñon belt ; also many trees which seem to be variously intermediate in characters between *jeffreyi* and *ponderosa*. In Seymour Cañon are a few sugar pines (*Pinus lambertiana*). And at the summit of the main ridge are several wind-beaten pines identified from cones and staminate flowers by Miss Eastwood as the fox-tail pine (*Pinus aristata*). A few of the same species in more symmetrical growth occur on the north side down among the firs. The steep north slope, from the summit down about 2000 feet, is quite heavily timbered with California white fir (*Abies concolor lowiana*). The upper slopes on the south and east, which are gentle, are not heavily timbered, the groups of Jeffrey pines being interspersed with openings, either bare or brushy. In places above 8000 feet there are extensive low thickets of *Symphoricarpus canescens* Eastwood, and, especially in moist spots, masses of gooseberry (*Ribes cereum* and *R. lacustre*, the latter more particularly on the shaded north side near springs).

In the most exposed places, especially on the west and south sides above 8000 feet, extremely dense mats of a dwarf lilac (*Ceanothus cordulatus*), two feet deep or so, practically prohibit progress through them. Acres of a low composite shrub (*Chrysothamnus tortifolius*) cover the otherwise bare rolling area about the summit.

It is obvious, from a consideration of the most conspicuous plants in conjunction with the animal life studied, that three life zones may be here conveniently recognized:—The Upper Sonoran, characterized by the piñon and sage; the Lower Transition, characterized by the Jeffrey pine; and the Upper Transition, characterized by the white fir. The boundaries are in some places remarkably abrupt; in others a broad interval of intermingling marks the mergence of zones. Some of the birds ranged through two of the zones; and a very few, the Parkman Wren, Lazuli Bunting and Sparrow Hawk, for instance, occurred through all three. And then there were many species which separately characterized each of the zones. Birds typical of Upper Sonoran were: Southern Wren-tit, Pasadena Thrasher, California Bush-tit, San Diego Wren, Brewer Sparrow, Black-chinned Sparrow, Western Gnatcatcher, Swainson Hawk, etc. Birds characteristic of Lower Transition were: Pygmy Nuthatch, Cassin Purple Finch, Audubon Warbler, Black-throated Gray Warbler, Western Chipping Sparrow, Mountain Chickadee, etc. Birds of Upper Transition were: Sierra Grouse, Stephens Fox Sparrow, Green-tailed Towhee, Band-tailed Pigeon, Clark Nutcracker, etc.

In the annotated list which follows, special attention is paid to the zonal distribution of each of the birds enumerated. I have to thank Miss Alice Eastwood, of the California Academy of Sciences, for naming for me the plants mentioned.

1. *Oreortyx pictus plumiferus* (Gould). MOUNTAIN PARTRIDGE.—Mountain Quail were plentiful from 5500 feet elevation to the summit, and many broods of young were met with, particularly around the cienegas. Almost every one of the grassy pockets in the north slope of Mount Pinos held its family of quail. On the approach of an intruder these would flutter into the adjacent gooseberry thickets, where they would remain completely lost to observation for the time being.

2. *Lophortyx californicus vallicolus* (Ridgway). VALLEY PARTRIDGE.

—Around Seymour Creek Meadow, at about 5500 feet elevation, a few, not more than a dozen, Valley Quail had their rendezvous. The species was seen at only one other place in the region, in a small valley on the south-east flank of Mount Pinos, at nearly 8500 feet. Here among the pines, in company with the prevailing Transition birds, a small band of Valley Quail was met with once, July 11. They were in some *Symphoricarpos* brush by a little cienega where Mountain Quail were often seen.

3. *Dendragapus obscurus sierræ* *Chapman*. SIERRA GROUSE. — We were told of the frequent capture of grouse in the pines down even as low as the sawmill. But this had been in winter when the snow makes it easier to see them. We saw grouse signs only among the firs on the north side. There in dry loose soil under drooping fir branches were dust-wallows and characteristic feathers. There must have been quite a number around though we actually saw but two, an old female with a half-grown young one. These were perched on fir boughs, and when approached the old bird kept clucking loudly until the youngster took flight, when both would swing down the mountain side into the dense woods out of sight. This constitutes the southernmost record-station for the Sierra Grouse.

4. *Columba fasciata* *Say*. BAND-TAILED PIGEON. — We estimated that fully twenty pairs of pigeons were at home about the summit of Mount Pinos. During the day they were evidently feeding mainly in the Jeffrey pines on the south side of the mountain. For at night just at dusk, they would come flying over the peak, singly and in small parties, alighting down among the dense firs on the north slope. Their deep monotonous *coo'-coo*, *coo'-coo*, *coo'-oo*, or *tuck-oo'*, *tuck-oo'* was a frequent sound at this place, and I have no doubt the birds had nests in the vicinity, though we saw no young. The crop of the single pigeon shot contained nothing but pine seeds.

5. *Zenaidura macroura* (*Linnaeus*). MOURNING DOVE. — Doves were frequently seen below 6500 feet, mostly about watering places, which they visited, as usual, in pairs.

6. *Gymnogyps californianus* (*Shaw & Nodder*). CALIFORNIA VULTURE. — The ranchers and stockmen interviewed said that Condors were of common occurrence in the vicinity. I saw a single individual twice flying over the summit of Mount Pinos. The conspicuous white patches on the under side of the wings render this bird the easiest of any of our larger species to identify in full flight at any considerable distance.

7. *Cathartes aura* (*Linnaeus*). TURKEY VULTURE. — Just one Turkey Buzzard was seen anywhere in the region. This bird was flying over Seymour meadow, 5500 feet.

8. *Accipiter cooperi* (*Bonaparte*). COOPER HAWK. — Seen but twice, on the mountain sides among the Jeffrey pines.

9. *Buteo borealis calurus* (*Cassin*). WESTERN RED-TAIL. — A single Red-tail was seen circling above Mount Pinos.

10. *Buteo swainsoni* *Bonaparte*. SWAINSON HAWK. — A pair of this

species with two nearly full-grown young lived in the neighborhood of Seymour Creek meadow, 5500 feet. Here they obtained an easy livelihood from the swarms of grasshoppers. Besides these, the stomach of one of the hawks shot, contained a nearly entire chipmunk (*Eutamias merriami*).

11. *Aquila chrysaëtos* (Linnaeus). GOLDEN EAGLE. — A pair or more were seen repeatedly about the summit of Mount Pinos.

12. *Falco mexicanus* Schlegel. PRAIRIE FALCON. — A single adult male specimen of the Prairie Falcon was shot by Dixon on July 4 at about 8000 feet elevation, among the Jeffrey pines. The stomach contained portions of a young Mountain Quail.

13. *Falco sparverius* Linnaeus. AMERICAN SPARROW HAWK. — Sparrow Hawks were but sparingly represented in the region, and noted only below 8000 feet.

14. *Nyctalops wilsonianus* (Lesson). AMERICAN LONG-EARED OWL. — I shot an adult male Long-eared Owl below the Columbus Borax Mine, 5000 feet, in the evening of June 25. Owls were apparently very scarce in the Mount Pinos country. We heard them at night only in one place, Seymour Cañon. The notes were unfamiliar and we concluded they might have emanated from a Spotted Owl.

15. *Dryobates villosus hyloscopus* (Cabanis). CABANIS WOODPECKER. — This woodpecker proved to be fairly common all over the mountain above 6000 feet. Full-grown young were noted June 28.

16. *Dryobates nuttalli* (Gambel). NUTTALL WOODPECKER. — A juvenile was secured in Seymour Cañon at 6500 feet on July 13; and another individual was heard on a subsequent day among golden oaks further down, at about 5500 feet.

17. *Xenopicus albolarvatus gravirostris* (Grinnell). SOUTHERN WHITE-HEADED WOODPECKER. — The White-headed Woodpecker was moderately common among the firs on the north side near the summit, while a few were met with in the Jeffrey pine belt down to 6500 feet. Both adults and young were secured. Dixon saw the species also on Frazier Mountain, 15 miles east of Mount Pinos. The specimens secured average nearest the large-billed race, *gravirostris*. The bills, however, which furnish the main distinguishing character, are slightly smaller than in the case of the San Gabriel birds. This lends evidence of intergradation with *albolarvatus*. Hence I employ the trinomial form of name.

18. *Colaptes cafer collaris* (Vigors). RED-SHAFTED FLICKER. — A few flickers, some of them juveniles, were encountered in the Jeffrey pine belt from 6500 feet to the summit.

19. *Phalænoptilus nuttalli californicus* Ridgway. DUSKY POOR-WILL. — The mellow notes of the Poor-will were heard regularly morning and evening in Seymour Cañon, 6000–6500 feet; and also one evening on the very summit of Mount Pinos, 8826 feet.

20. *Aëronautes melanoleucus* (Baird). WHITE-THROATED SWIFT. — On July 9 several White-throated Swifts were seen flying about the summit of Mount Pinos.

21. *Calypte anna* (Lesson). ANNA HUMMINGBIRD. — Several were noted about Seymour Meadow, 5500 feet, July 13-16.

22. *Selasphorus alleni* Henshaw. ALLEN HUMMINGBIRD. — Around our camp in Seymour Cañon, 6500 feet, this species was first seen on July 1, and shortly thereafter became notably common. At first only adult males were seen, but within a few days females and juveniles made their appearance. Masses of monkey flowers (*Mimulus langsdorfi* and *cardinalis*), columbines (*Aquilegia* sp.?) and other plants (*Stachys albens*, *Castilleja grinnelli*, etc.) began to burst into bloom during the first week in July about the wet places in the cañon bottoms. And these flower masses were the scenes of many noisy revels among the Allen Hummers, sometimes as many as five of the birds taking part in what looked like a free-for-all fight. I do not believe this species of hummingbird bred anywhere in the region, as they made their appearance after the close of the usual nesting period. It seems probable that they had immigrated from the coast belt to the west and northwest where the species is known to nest.

23. *Stellula calliope* (Gould). CALLIOPE HUMMINGBIRD. — This, our most diminutive species of hummingbird, proved to be fairly common on Mount Pinos above 6500 feet, being practically confined to the Jeffrey pine belt. The little meadows between 7500 feet and 8500 feet, grown up to blue flags (*Iris missouriensis*), seemed to be the favorite resort. Only juveniles and adult females were taken. Not a single male Calliope Hummingbird was seen. These had probably emigrated immediately after the nesting season, as is the habit of male hummers generally, leaving the females to bring up the young.

24. *Tyrannus verticalis* Say. WESTERN KINGBIRD. — At Seymour Meadow, 5500 feet, a pair of kingbirds had their nest on a lower horizontal branch of a yellow pine, 35 feet up. The young left the nest on July 12, the whole family finding a plentiful food-supply in the hordes of grasshoppers which infested the meadow.

25. *Myiarchus cinerascens cinerascens* (Lawrence). ASH-THROATED FLYCATCHER. — A pair was seen in Seymour Cañon, 6000-6500 feet, and one or two more were met with at the meadow, 5500 feet.

26. *Sayornis saya* (Bonaparte). SAY PHŒBE. — A family of Say Phœbes, adults and three young, made their appearance June 30 at Seymour Meadow, 5500 feet. They had undoubtedly nested somewhere in the near neighborhood.

27. *Nuttallornis borealis* (Swainson). OLIVE-SIDED FLYCATCHER. — The Olive-sided Flycatcher was relatively numerous all over the mountain above 6500 feet. The weird call-notes, so familiar to frequenters of our California sierras, are to me the most impressive of mountain bird-voices.

28. *Contopus richardsoni richardsoni* (Swainson). WESTERN WOOD PEWEE. — This species occurred sparingly through the Jeffrey pine belt from 6500 feet to the summit. In Seymour Cañon, a nest was noticed high up on a horizontal pine branch.

29. *Cyanocitta stelleri frontalis* (Ridgway). BLUE-FRONTED JAY. — Blue-fronted Jays were moderately common all over the mountain above 6000 feet. Adults and full-grown young, as is usually the case, gathered about our camp in Seymour Cañon, quietly pilfering whatever they took a notion to, including our soap. The specimens secured are typical of the Sierran form, showing no tendency whatever toward *carbonacea* of the coast belt further north.

30. *Aphelocoma californica californica* (Vigors). CALIFORNIA JAY. — This jay was a characteristic bird of the piñon belt, below 6000 feet. Above this it was not seen excepting once: In a little valley at nearly 8500 feet, on the southeast exposure of the mountain, several California Jays were noted on July 11.

31. *Nucifraga columbiana* (Wilson). CLARK NUTCRACKER. — Adults and full-grown young were abundant about the summit of Mount Pinos, particularly in the fir belt. Below this they were occasionally seen down to 6500 feet, and several were met with even in the piñons at 5500 feet. Nutcrackers were by far the most conspicuous of the mountain birds, both on account of their penetrating voices, and on account of their strikingly contrasted black and white wing-markings, which render the birds in flight plainly seen against most any background.

32. *Sturnella neglecta* Audubon. WESTERN MEADOWLARK. — A family of adults and nearly full-fledged young had their headquarters at Seymour Meadow, 5500 feet.

33. *Icterus bullocki* (Swainson). BULLOCK ORIOLE. — Several adults and young were noted in the golden oaks and rose thickets about Seymour Meadow, 5500 feet.

34. *Euphagus cyanocephalus* (Wagler). BREWER BLACKBIRD. — A small flock was seen several times at Seymour Meadow, 5500 feet, where they were voraciously feeding on grasshoppers.

35. *Carpodacus cassinii* Baird. CASSIN PURPLE FINCH. — The Cassin Purple Finch was present in numbers all over the mountain, from 6500 feet in Seymour Cañon to the summit. The birds were particularly noticeable in the Jeffrey pine woods at 7000–8000 feet elevation. Here they were to be seen feeding on the ground in pairs or small companies, which would take to the lofty tree-tops when disturbed. Half-fledged young were noted on June 29.

36. *Carpodacus mexicanus frontalis* (Say). HOUSE FINCH. — A very few linnets were in constant attendance at Seymour Meadow, 5500 feet. Much to our surprise, on July 11, we encountered a large flock of House Finches, both old and full-grown young, in a small valley on the southeast side of the mountain at nearly 8500 feet. These we concluded had wandered up since the nesting season from a much lower altitude.

37. *Loxia curvirostra bendirei* Ridgway. SIERRA CROSSBILL. — I several times thought I saw crossbills among the taller tree-tops. But the close similarity in general appearance and behavior at a distance to the Cassin Purple Finch, rendered identification uncertain in all cases but

one. On the 6th of July I shot an adult pair of crossbills from a pine near the summit of Mount Pinos. The male is in full feather, having nearly the entire body plumage orange-vermilion. The two birds measure in millimeters as follows:—♂, wing, 97; tail, 65; culmen, 19; depth of bill, 10. ♀, wing, 93; tail, 64; culmen, 19; depth of bill, 10. The gullet of one of the birds contained 13, mostly whole, shelled, Jeffrey pine seeds. This is the southernmost summer record of the crossbill in California. In fact I can find but one other record of its occurrence so far south at any season, that by Daggett of its presence at Pasadena in December, 1898.

38. *Astragalinus psaltria hesperophilus* *Oberholser*. GREEN-BACKED GOLDFINCH.—A single pair was seen for several days at our camp in Seymour Cañon, 6500 feet.

39. *Astragalinus lawrencei* (*Cassin*). LAWRENCE GOLDFINCH.—The Lawrence Goldfinch was fairly common above 6500 feet on Mount Pinos. Adults and full-grown young were frequently seen about springs among the firs on the north slope near the summit. A pair or so were also met with on the lower Seymour Creek at 5500 feet.

40. *Spinus pinus pinus* (*Wilson*). PINE SISKIN.—Siskins were common from the lower edge of the Jeffrey pine belt, say 6000 feet, to the summit. Many daily visited the trickles of water in Seymour Cañon near our base camp. And among the firs on the north side near the summit full-grown young with their parents were of frequent note.

41. *Chondestes grammacus strigatus* (*Swainson*). WESTERN LARK SPARROW.—The Western Lark Sparrow was a fairly common species of the open valleys of the region. There were several pairs about Seymour Creek Meadow, and a nest was found there on June 28, containing three fresh eggs. It was on the ground, sunk into a bunch of grass under a sage bush. A surprise came to us when we later encountered several Lark Sparrows in the open places on the very summit of Mount Pinos, 8800 feet. As with the Sage Sparrows found there at the same time, we concluded that they had wandered up the mountain after nesting at a lower level.

42. *Spizella socialis arizonæ* *Cones*. WESTERN CHIPPING SPARROW.—The Western Chipping Sparrow proved to be a fairly common bird of the pine woods from 6500 feet to the summit. It is not a brush-loving bird, being most often seen on the forest floor, feeding among the fallen needles, or at the edges of the grassy cienegas, often in company with juncos.

43. *Spizella breweri* *Cassin*. BREWER SPARROW.—The Brewer Sparrow was a characteristic species of the sage valleys of the region. It was first met with as we approached Mount Pinos through Cuddy Cañon, at about 4500 feet elevation, and was not seen above 6000 feet in any place. On the sage flat above Seymour Creek Meadow the species was numerous. Full-grown young were taken June 26, and on June 28 several nests were found located from 1½ to 3 feet above the ground in sage bushes

(*Artemisia* and *Chrysothamnus*). One nest contained three eggs and one newly-hatched young, and another held two eggs and one young. Most of the nests were by this time vacant. In structure the nests of the Brewer Sparrow very closely resemble those of the Chipping Sparrow, as might be expected from the close similarity between the birds themselves. It is worthy of remark that in no place in this region did the local ranges of these two species overlap.

44. *Spizella atrogularis Cabanis*. BLACK-CHINNED SPARROW.—The Black-chinned Sparrow was also an inhabitant exclusively of the sage belt, along with the Brewer and California Sage Sparrows, but in not nearly so large numbers as the latter two species. In the vicinity of Seymour Creek Meadow, between 5500 and 6000 feet, there were perhaps but half a dozen, as the same individuals were probably seen and heard repeatedly. We were fortunate enough to run across a nest of the Black-chinned Sparrow, June 28. This was a very flimsy affair, lacking the neat internal appearance and general compactness for which the nests of the Chipping Sparrow are notable. It was built among the slanting twigs of a sage bush, 2 feet above the ground, and contained two small young.

45. *Junco hyemalis thurberi Anthony*. SIERRA JUNCO.—Juncos were numerous from 7000 feet to the summit, and full-grown young were seen soon after our arrival. The birds showed evident preference for the small springy meadows, especially those on the north side of Mount Pinos, where the steep slopes and dense firs contributed to maintain a cool shade. On the sunny side and at lower altitudes parents and young were to be met with feeding on the ground among bushes, often in company with Chipping Sparrows and Bluebirds. On the north side, below the spring nearest the summit, I found two nests, July 11. These were both discovered while I was setting a line of mouse traps along the little stream, and both were so artfully concealed that the most careful direct search would have failed, had I not almost trodden upon the sitting birds, which thereupon flew out from under my feet. The nests were in each case sunk into the sod, so that the rims were flush with the surrounding surface, and overhung by prickly goose-berry bushes. Each contained three eggs, incubated but slightly.

46. *Amphispiza belli canescens Grinnell*. CALIFORNIA SAGE SPARROW.—The California Sage Sparrow was an abundant bird in the valleys of the region, occurring coëxtensively with the sage-brush (*Artemisia tridentata* and *Chrysothamnus mohavensis*). Juveniles were nearly all full-fledged by the last of June. I was surprised to find several bands of full-grown young among the gooseberry bushes (*Ribes cereum*) on the very summits of both Mount Pinos and Sawmill Mountain. These may possibly have been reared there, but I think more probably had recently wandered up from the sage slopes which in places stretch up to fully 6500 feet on the south sides of the mountains. The nine specimens preserved struck me at once as differing from the Bell Sparrow of the coast region

of California. Upon gathering together series of *Amphispiza*, I became convinced of the advisability of proposing the recognition of a new race represented by the Mount Pinos skins. This was done in 'The Condor' for January, 1905, page 18.

47. *Passerella stephensi* (Anthony). STEPHENS FOX SPARROW. — The Stephens Fox Sparrow proved to be fairly numerous on Mount Pinos and its westward spur, Sawmill Mountain, but strictly above 8000 feet. In the relatively rank growth of gooseberry bushes and other vegetation about springs and swales, particularly on the shaded north side among the firs, fox sparrows kept their presence known by frequent repetition of their loud ringing song, to me the most pleasing of mountain bird voices. Thirteen specimens of *Passerella* were secured on Mount Pinos. Two of these were full-grown juveniles taken July 11, and another, a half-grown fledgling, was taken on June 29. The remaining ten adults measure in millimeters as follows: —

No., Coll. J. G.	Sex.	Wing.	Tail	Cul- men	Bill from Nostril.	Ramus of Lower Mandible from lateral base to tip.	Width of Bill at base of Lower Mandible.
5818	♂	86	93	15	11.7	17	12.7
5897	♂	84	93	14	10.5	15.2	12
5891	♂	85	94	13.7	10.2	15.2	12.9
5896	♂	86	96	15.7	11.5	16.5	12.5
5895	♂	83	90	14	11	15.5	13
5819	♂	86.5	98	16.2	12	17	13
5817	♂	84	93	15.5	11.7	16	12.9
Average	7 ♂ s	85	94	15	11.2	16.1	12.7
5894	♀	75.5	87	14	10.2	16.5	12.7
5816	♀	80.5	89	15	11.5	16.2	12
5892	♀	79	86.5	14.5	11	16	12
Average	3 ♀ s	79.3	87.5	14.5	10.9	16.2	12.2

The above measurements show the fox sparrows from Mount Pinos to be in no respects smaller than those from the San Gabriel and San Bernardino Mountains to the southward. In fact one extreme (No. 5819) has a slightly larger bill than the largest examined from the other localities. The tremendously enlarged bill of *stephensi* is characteristic, and separates it readily from its nearest relative *megarrhyncha* of the central Sierra Nevada. Among numerous specimens of both forms, I see no intergradation by way of individual variation, and it is quite certain that there is a broad geographical hiatus between Mount Pinos and the nearest favorable region of the Sierras. Of course it is possible that intermediate examples will be forthcoming from the southern Sierra Nevada when these mountains are explored. But with the present available material, by every criterion (except personal "feeling"!) *stephensi* should

be considered a distinct species with binomial appellation. The present record places a known breeding locality of *stephensi* some seventy miles northwest of its previously northernmost known station, Mount Waterman. And I know of no probable breeding place between, for the fox sparrow is a bird of extreme upper transition and boreal. The only other possibly favorable locality, Frazier Mountain, near Tejon Pass, was visited by Dixon, who went to its summit on July 18, without noting any fox sparrows. Although over 8000 feet high it is too dry and too near the influence of the hot interior plateau. The breeding records so far for the Stephens Fox Sparrow indicate a very spotty range, viz.:—a very limited area on San Jacinto Peak, a rather more extensive region on the San Bernardino Mountains, a very limited tract along the highest ridges of the San Gabriel Mountains, and the very small area on Mount Pinos.

48. *Pipilo maculatus megalonyx* (Baird). SPURRED TOWHEE.—Spurred Towhees were observed only below 6500 feet. They were sparingly represented along Seymour Cañon where young were taken near our base camp by June 27.

49. *Oreospiza chlorura* (Audubon). GREEN-TAILED TOWHEE.—Green-tailed Towhees were common on Mount Pinos in much the same surroundings as chosen by the Stephens Fox Sparrow; but the former were noted a little lower, down to about 7500 feet on the east side of the mountain. In the clumps of gooseberry, *Ceanothus* and *Symphoricarpus* brush, the Green-tailed Towhees were to be heard and seen plentifully. Full-grown young were taken by July 11. This species was also discovered on Frazier Mountain, 15 miles east of Mount Pinos.

50. *Zamelodia melanocephala capitalis* (Baird). BLACK-HEADED GROSBEAK.—Not common; single individuals were met with in several places about the mountain, even on the very summit where one was heard singing violently from a dense fir tree late one evening.

51. *Cyanospiza amoena* (Say). LAZULI BUNTING.—At Seymour Creek Meadow, about the thickets of rose-bushes and willows, Lazuli Buntings were notably plentiful. A few were also observed in the cañons further up the mountain; and even about the cienegas as high as 8000 feet, where gooseberry and *Symphoricarpus* thickets furnished cover, the song of this bird was often to be heard.

52. *Piranga ludoviciana* (Wilson). WESTERN TANAGER.—Tanagers were met with chiefly in the cañons among the golden oaks, from 6000 to 6500 feet elevation. One pair was seen in the fir zone on the north slope near the summit.

53. *Progne subis hesperia* Brewster. WESTERN MARTIN.—Only noted once: three were seen flying about over the summit of Mount Pinos on June 29.

54. *Petrochelidon lunifrons lunifrons* (Say). CLIFF SWALLOW.—A few, mostly birds-of-the-year, were seen flying about in company with Violet-green Swallows over Seymour Meadow, 5500 feet, July 15.

55. *Tachycineta thalassina lepida* (Mearns). VIOLET-GREEN SWAL-

LOW.—Violet-green Swallows were abundant all over the mountain, though apparently nesting only in the Jeffrey pine belt. On moonlight nights they twittered almost incessantly all night long, at least whenever we happened to be awake. They would be seen flying about, with the last faint light of evening, and again at dawn. Judging from the directions of their voices, we supposed the swallows to take flight in companies, at intervals as the twittering augmented, fly about overhead awhile, and then settle down for a quiet spell, only to repeat the manœuvre.

56. *Vireo solitarius cassini* (*Xantus*). CASSIN VIREO.—This was the only species of vireo met with in the region. A single pair of the Cassin Vireo was evidently nesting somewhere near our camp at 6500 feet in Seymour Cañon. The male bird sang at morning and evening from a thicket of golden oaks nearby.

57. *Dendroica auduboni auduboni* (*Townsend*). AUDUBON WARBLER.—Audubon Warblers were common in the Jeffrey pine belt from 6500 feet to the summit. They were seen feeding nearly full-fledged young by June 28.

58. *Dendroica nigrescens* (*Townsend*). BLACK-THROATED GRAY WARBLER.—This species was noted from 5500 feet to the summit, but was best represented, numerically, in the golden oaks of the cañons between 6000 and 7000 feet altitude.

59. *Toxostoma redivivum pasadenense* (*Grinnell*). PASADENA THRASHER.—The Pasadena Thrasher was but sparsely represented in the region. It was detected only in the brush belt below 5500 feet down toward Lockwood Valley. The two specimens secured fully warrant the above subspecific determination.

60. *Salpinctes obsoletus obsoletus* (*Say*). ROCK WREN.—We found a family of Rock Wrens, adults and full-grown young, among the boulders on the very summit of Mount Pinos.

61. *Catherpes mexicanus punctulatus* *Ridgway*. DOTTED CAÑON WREN.—A single family of Cañon Wrens in Seymour Creek Cañon, between 6500 and 7000 feet altitude were the only representatives of the species met with.

62. *Thryomanes bewicki charienturus* *Oberholser*. SAN DIEGO WREN.—This form of the Bewick Wren was fairly common in the brush below 6000 feet. The single specimen preserved, an adult female, is in such worn plumage as to preclude positive subspecific identification. But a careful comparison with skins in corresponding plumage leads me to refer it to *charienturus* of the San Diegan district, rather than to *drymaeus* of the San Joaquin-Sacramento region.

63. *Troglodytes aëdon parkmani* (*Audubon*). PARKMAN WREN.—This wren seems to be quite indifferent to altitude. A few were nesting among the white firs on the north side near the summit, while a family of young were found at 5500 feet near the Borax Mine. However, Parkman Wrens did not prove even ordinarily common anywhere about the mountain.

64. *Certhia americana zelotes* (*Osgood*). SIERRA CREEPER.— Creepers were in evidence in moderate numbers among the pines and firs from 7000 feet to the summit. The specimens obtained show the Mount Pinos bird to be unquestionably referable to the Sierran form, *zelotes*, and not to the race, *occidentalis*, which occurs near the coast of southern Monterey County, 175 miles to the northwestward.

65. *Sitta carolinensis aculeata* (*Cassin*). SLENDER-BILLED NUTHATCH.— Above the 6000 foot contour level this nuthatch was locally numerous. In the golden oaks of Seymour Cañon it was about the commonest bird. But elsewhere it was found notably numerous only in a small part of the fir woods on the north slope near the summit.

66. *Sitta pygmæa pygmæa* (*Vigors*). PYGMY NUTHATCH.— Very common in the Jeffrey pine belt, and apparently exclusively confined to it. From 6000 feet to the summit on the south exposure, Pygmy Nuthatches were to be heard or seen almost constantly. Young were plentiful from the date of our arrival.

67. *Bæolophus inornatus inornatus* (*Gambel*). PLAIN TITMOUSE.— Titmouses were occasionally observed in the brush and golden oaks below 6500 feet.

68. *Parus gambeli* *Ridgway*. MOUNTAIN CHICKADEE.— Very common all over the mountain above 6000 feet: Most numerous in the Jeffrey pine belt.

69. *Chamæa fasciata fasciata* (*Gambel*). SOUTHERN WREN-TIT.— A pair were seen in a manzanita thicket in Seymour Cañon at 6500 feet, but none higher. In the brush belt at 5500 feet and lower, the species was sparingly represented. The two adults secured belong to the same race as specimens from the vicinity of Los Angeles.

70. *Psaltiriparus minimus minimus* (*Townsend*).—CALIFORNIA BUSH-TIT.— Flocks of bush-tits were frequent in the golden oaks and brush below 6500 feet.

71. *Polioptila cærulea obscura* *Ridgway*. WESTERN GNATCATCHER.— A very few were noted in company with bush-tits at 5500 feet below Seymour Creek Meadow.

72. *Merula migratoria propinqua* (*Ridgway*). WESTERN ROBIN.— Robins were present in relatively small numbers only, and were confined to the upper parts of the mountain, above 8000 feet. Perhaps 20 individuals were seen altogether, some feeding on the ground about moist cienegas, others singing from lofty perches at the tips of pines. No nests or young were discovered; but the robins were surely breeding, for the ovary of a female secured contained a fully formed yolk.

73. *Sialia mexicana occidentalis* (*Townsend*). WESTERN BLUEBIRD.— Bluebirds were abundant all over Mount Pinos, even down into the piñon belt. In favorable spots, such as damp meadows, young and adults were congregated into companies, quiet, but effective in putting great numbers of larval grasshoppers out of sight.

NOTES ON THE BREEDING OF BACHMAN'S WARBLER, *HELMINTHOPHILA BACHMANII* (AUD.),
NEAR CHARLESTON, SOUTH CAROLINA,
WITH A DESCRIPTION OF THE
FIRST PLUMAGE OF THE
SPECIES.

BY WILLIAM BREWSTER.

I AM indebted to Mr. Arthur T. Wayne for the privilege of announcing an interesting and important discovery that he has just made, *viz.*, that Bachman's Warbler breeds, at least locally and sparingly, in the coast region of South Carolina. Mr. Wayne's experience may be best given in his own words. Under date of May 14, 1905, he writes as follows: "I have at last found a breeding ground of Bachman's Warbler. Yesterday I took two young in first plumage which the parents were feeding I saw two pairs of old birds and heard another adult male singing. These Warblers during the breeding season are very hard to detect. They are extremely active, rarely remaining still for more than a few seconds at a time, and are found in low bottom lands where there is plenty of water They must breed only about ten days later than the Yellow-throated Warbler, for the young taken on the 13th could fly with ease."

In a second letter dated May 22, 1905, Mr. Wayne adds: "The locality in which I found the small colony of Bachman's Warblers is distant about fourteen miles from where I live [Mount Pleasant, South Carolina]. The country is very swampy and was originally a rice field, but is now covered with a dense forest of deciduous trees with innumerable patches of low bushes and blackberry brambles. Flanking this forest is an enormous back water (reservoir), from the bottom of which have grown millions of buttonwood bushes. Bachman's Warbler appears to be very partial to these buttonwood bushes which grow in the water. I shot a male on May 14 of last year that kept constantly over the water among the buttonwood bushes. The song period appears to be of very short duration. I visited the place again last Saturday [May 20] and heard but one male singing."

The two young birds taken on the 13th represent both sexes. The male which is now before me may be described as follows:—Top and sides of head and fore part of back faded hair brown with a trace of ashy on the middle of crown; remainder of upper parts dull olive green; wings and tail (which are fully grown) as in the first winter plumage excepting that the greater and middle wing-coverts are rather more broadly tipped with light brown, forming two well-marked wing-bars; chin and throat brownish white tinged with yellow; sides of jugulum smoke gray, its center yellowish; sides of breast gamboge yellow shading into olive on the flanks; middle of breast, with most of abdomen, yellowish white; under tail-coverts ashy white. All the feathers on the under parts which are strongly yellow or olive, and those on the upper parts which are decidedly ashy or greenish, appear to belong to the autumnal plumage or, as it is now called, the first winter plumage, but all the other feathers on the head and body are evidently those of the first plumage.

On comparing this interesting specimen with young in corresponding plumage of *H. chrysoptera*, *H. pinus* and *H. celata lutescens*, I find that it is very unlike any of them; in respect to the general coloring of the upper parts, however, it bears some resemblance to the Nashville Warbler (*H. rubricapilla*) in first plumage.

I have not seen the young female Bachman's Warbler above referred to, but Mr. Wayne writes me that "it differs from the male only in these respects: The yellow on the sides of the breast is very much paler and more restricted and the back is not greenish, but brownish. The white on the tail-feathers is merely indicated on the margins of the inner webs of the tail-feathers."

Both of the young Bachman's Warblers just described were from the same brood and hence of the same age. The young male was being fed by the male parent of the family and the young female by the female parent. Mr. Wayne saw only "these two young" but his "nephew, who was with" him at the time, "is satisfied that he saw at least one or two more." They could all "fly with the greatest ease and their movements were extremely rapid."

It will be remembered that Bachman's Warbler was originally discovered by the ornithologist whose name it bears "a few miles

from Charleston, in South Carolina, in July, 1833,"¹ when "an old female that had to all appearance just reared a brood of young"² was taken. "Shortly after, several were seen in the same neighborhood."¹ The season at which these birds were met with was not, of course, sufficiently early to make it at all certain that they were still on or even very near their breeding grounds, for many of our Warblers reach the Dry Tortugas on their southward migration before the middle of July. Mr. Wayne's observations are therefore of much importance as definitely establishing, for the first time, the fact that Bachman's Warbler actually breeds in the low coast region of South Carolina. It would be interesting to know if the species has been a regular summer resident of this region ever since 1833. If so it must be confined to only a very few localities, at least in the neighborhood of Charleston. Were the case otherwise the bird would almost certainly have been found, long before this, by Mr. Wayne, for he is one of the most acute, persistent and thorough of the many excellent field ornithologists whose names have come into prominence in this country within the past quarter of a century, and there are few woods or swamps anywhere near Charleston which he is not accustomed to visit at all seasons.

¹ J. J. Audubon, *Birds of America*, II, 1841, 93.

² John Bachman, *Ibid.*

NOTES ON CERTAIN BIRDS TAKEN OR SEEN
NEAR CHARLESTON, SOUTH CAROLINA.

BY ARTHUR T. WAYNE.

Gavia imber. LOON.—On June 12, 1905, my friend, Dr. Eugene Edmund Murphy, who was making a trip by water from Charleston to my place, saw an *adult* of this bird. On June 19, 1905, while I was coming home from Dewees Island, S. C., I saw a young Loon and watched it for about 30 minutes. It dove with the greatest ease, and would remain under water for a very long time, and nearly every time it appeared, a fish was seen in its bill. This bird could not have been wounded, thus preventing it from migrating. On June 9, 1902, I observed an immature bird of the above species.

Gavia lumme. RED-THROATED LOON.—I shot an example of this boreal loon on April 8, 1905, near Long Island, S. C. The specimen is a young male and is in first winter plumage, changing into nuptial plumage on the sides of throat. This specimen makes the second taken near Charleston. For a record of the first, see 'The Auk,' Vol. VII, January, 1890, p. 88. The first specimen was taken on October 15, 1889, by the writer and is in first winter plumage.

Sterna caspia. CASPIAN TERN.—As far as I am aware there has never been any specific record of the occurrence of this large tern for the coast of South Carolina, it being generally confounded with the Royal Tern (*Sterna maxima*), ever since the time of Audubon and Bachman. The former, in his 'Birds of America,' Vol. VII, p. 78, refers to the Cayenne Tern (= *Sterna maxima*) as breeding in Labrador, which was a mistake, as the tern Audubon found breeding there was the Caspian (*S. caspia*).

On April 24, 1905, a most magnificent adult male, in perfect nuptial plumage, was shot by my nephew, Mr. Ferdinand Gregorie, Jr., at my request. The Caspian Tern is a permanent resident on the South Carolina coast, and it *breeds* in small numbers on 'Bird Bank,' Bulls Bay. On June 19, 1905, I counted upwards of fifty of these terns when I was off Dewees Island, S. C., and

all of them appeared to be moulting on the top of head. This moult usually takes place as early as June 3, that is the first inception.

Mr. Chapman, in his 'Birds of Eastern North America,' states that this tern "apparently does not winter within our limits." I am pleased to say that during the past winter, which was a very severe one, I frequently saw and *heard* this tern during the months of December, January, and February, but after February 18, 1905, they disappeared until March. The notes of this tern are unmistakable, being very guttural, and they bear no resemblance to those of *Sterna maxima*, the latter being pitched in a high key.

Sterna forsteri. FORSTER'S TERN.—In the A. O. U. Check-List for 1895, the range of this tern in winter is given as "southward to Brazil." On January 7, 1905, I shot an example (male) in first winter plumage from a flock of ten or more individuals. The thermometer was far below the freezing point, and a regular blizzard was prevailing. On June 18, 1901, I saw on 'Bird Bank,' Bulls Bay, thousands of these terns, but none of these birds breed on the South Carolina coast, and the mystery is why were they there at the height of the breeding season? All of these terns appeared to be in immature plumage, yet they could not have been barren birds.

Querquedula cyanoptera. CINNAMON TEAL.—April 12, 1904, I shot an adult female of this teal, less than one fourth of a mile from my home. This little duck was in company with a female Blue-winged Teal, in a puddle of water scarcely large enough or deep enough for a duck to float in. Both ducks were taken, but only the Cinnamon Teal was preserved. I well remember a sagacious remark Mr. Brewster made to me, many, many years ago, in reference to the migration of birds, the substance of which was, that during the migration, a person could look for ducks in a basin of water, which is exemplified by the above. The capture of this duck makes the first record for South Carolina, and the second or third for the Atlantic coast.

Porzana noveboracensis. YELLOW RAIL.—On February 3, 1904, while out partridge shooting, I saw my dog pointing in a low, wet piece of open land with a dense growth of short, dead

grass, and being unable to flush anything myself, although I trampled the grass down in every direction, I told her to take it. She at once caught a Yellow Rail, which was the first one I had ever seen alive in South Carolina. I then made her hunt the entire field, and in less than ten minutes she caught two more. These three Yellow Rails were caught near sunset. The next morning, February 4, I again visited the field, in company with my dog, and in less than five minutes she had caught another; while a second specimen was flushed and shot. On February 5 and 8, two more were taken, which make seven in all. On November 19, 1904, my dog again captured another one alive. These rails would not flush, although in every instance I tried my utmost to make them fly, and the only one that did elude the dog by flying, was due to the dog's failure to seize it in a very thick growth. The stomachs of these rails contained the remains of a species of fresh-water snail. One of the specimens taken Feb. 3, ♀ ad., shows melanism in a marked degree.

Porzana jamaicensis. LITTLE BLACK RAIL.—On September 13, 1899, I shot a superb specimen of this rail in a pea field, where the vines were being cut by a reaper. In this same field, which was then planted in oats, I secured on June 10, 1903, a nest and eight eggs, and also captured both parents. The nest was built on high ground, in the oats, and I saw the female *on the nest*. A description of the nest, eggs, and the habits of the birds, has been published by the writer in 'The Warbler,' 2d Series, Vol. I, No. 2, 1905.

Phalaropus lobatus. NORTHERN PHALAROPE.—On the morning of June 3, 1903, my cat brought into the house a specimen of this species, but before I could secure it from her, she had eaten all except a wing, which is all the evidence I had by which to identify the bird. It was evidently an adult female in high plumage, and is the only record I have for the coast of South Carolina, and the capture occurring at so late a date is worthy of being mentioned.

Nuttallornis borealis. OLIVE-SIDED FLYCATCHER.—During the second week of September, 1904, I saw, and positively identified, a bird of this species. I had a record of the *day* of the month, but it has been misplaced. When first seen, the bird was

on the top of a dead willow tree which was in an impenetrable ravine. I was within twenty feet of the tree upon which this Flycatcher was perched, but I would have mutilated the specimen by shooting it from where I was standing, and I could not retreat as I was in a road flanked on both sides by the jungle; therefore as it could not be obtained without being mutilated I determined not to shoot it. There is no question whatever as to the correct determination of this species, as the specimen was positively identified. The bird was seen some days after the occurrence of a very severe storm which raged on the coast of South Carolina, and this record makes the first for the coast region. This species undoubtedly occurs at the proper seasons in the mountainous parts of the State, but it is a *rara avis* on the coast.

Coturniculus henslowii. HENSLOW'S SPARROW.—On January 28, 1905, I took an adult female Henslow's Sparrow, which has *thirteen* rectrices. This makes the second species of the Fringillidæ that I have taken which had thirteen rectrices. The first was Bachman's Finch (*Peucaea æstivalis bachmanii*), female, February 5, 1902. The additional rectrix may prove to be a character peculiar to *females* of the Fringillidæ, and not to the males in certain genera.

Piranga rubra. SUMMER TANAGER.—A very adult male of this species was taken by the writer on May 22, 1903. This specimen has seven normal rectrices, but upon close inspection it was found that the missing tail-feathers were being renewed—not of the color of the adult male, but of the color of the female and young males. That this specimen was retrogressing is plainly shown by the five rectrices which were being moulted. These five feathers are about an inch in length, and the color is yellowish olive-green. It would seem but natural that once this species attained the adult plumage, each moult would be the same. As an illustration of the progressive stage of plumage of the Summer Tanager, I have a specimen (young male) taken May 5, 1903, which is half red and half yellowish green, or in other words mottled. This bird had evidently passed through a post-juvenal moult. There are eleven yellowish olive feathers in the tail, which are very much worn, in fact some are skeletonized, which shows that these were never moulted after the "first plum-

age." The twelfth is the central tail-feather, being freshly moulted, and of a dull red color, as in the adult male.

Helmitheros vermivorus. WORM-EATING WARBLER. — A generic character of the genus *Helmitheros* is the absence of white margins or spots from the rectrices. I have a superb specimen of this Warbler which has two of the outer rectrices on each side very widely margined with pure white; the next rectrix, on each side, is also margined with white, but the area is less. This specimen, No. 4013, closely resembles, in the tail markings, certain species in the genera *Helminthophila* and *Dendroica*, and was shot by the writer on April 16, 1901, and is an adult male.

Helminthophila bachmani. BACHMAN'S WARBLER. — I shot on May 14, 1904, an adult male of this species, and saw the female. It required nearly four hours of constant work in order to secure this restless warbler. On May 13, 1905, I discovered three pairs of these birds and succeeded in taking two young in first plumage, which were being fed by their parent. The young male was being fed by the adult male, and the young female was fed by the adult female! The old birds were not molested. A description, by Mr. Brewster, of the young, which are the first ever taken, will appear in 'The Auk' [see *antea*, pp. 392-394]. Mr. Brewster, visited South Carolina in May, 1883, and also in the spring of 1884 and 1885, especially to search for Bachman's and Swainson's Warblers, and, although we went almost daily, we were unsuccessful in finding the former. For the rediscovery of Bachman's Warbler, by the writer, in South Carolina, see 'The Auk,' Vol. XVIII, July, 1901, pp. 274-275.

Seiurus aurocapillus. OVEN-BIRD. — I secured a fine specimen, ♂ ad., of this bird on January 20, 1904, while out woodcock shooting. This specimen was very fat, which is surprising considering the severe weather which prevailed during December and January. I have frequently seen the Oven-bird in the early part of December, and the capture of this bird in January proves that it winters here sparingly.

Seiurus noveboracensis. WATER-THRUSH. — On January 20, 1887, I shot a female of this bird. On examining the throat I found in it two or three small minnows, which seem to be a very curious diet for an insectivorous bird. This specimen is No.

1614 of my register, and is now in the collection of my friend Mr. William Brewster.

Anthus spragueii. SPRAGUE'S PIPIT.—On the morning of November 1, 1904, I saw and *heard* a Sprague's Pipit *sing* while it was flying high in the heavens. I apparently saw the very spot where it alighted, but although I hunted the ground thoroughly throughout the entire day, I failed to find the bird. For previous records of the capture of this species in South Carolina by the writer, see 'The Auk,' Vol. XI, 1894, p. 80, and Vol. XVIII, 1901, p. 275.

In this connection I wish to place on record a bird of this species which I saw and also heard *sing* while it was flying overhead. This record was made the first week in November, 1892, on the west shore of Lake Tohopekaliga, Osceola County, Florida. I have no doubt that ornithologists who will investigate the fauna of this lake during the winter, will find this species to be a regular winter visitor there.

THE STATUS OF CERTAIN SWAINSONIAN GENERA OF BIRDS.

BY J. A. ALLEN.

IN a recent paper by Mr. Oberholser, entitled 'Notes on the Nomenclature of Certain Genera of Birds' (Smiths. Misc. Coll., Quart. Issue, III, pp. 59-68, May 13, 1905), noticed on a later page of this journal (*postea*, p. 436), several genera proposed by Swainson in 1827 are considered, with the result that Mr. Oberholser concludes that the status hitherto universally conceded to them by ornithologists "must apparently be changed." These genera are *Xiphorhynchus*, *Vermivora*, *Tiaris*, and *Ammodramus*. The first (*Xiphorhynchus*) is transferred to displace *Dendrornis* Eyton, 1852, and the new name *Xiphornis* is proposed for the

group hitherto currently recognized under the name *Xiphorhynchus*, resulting in a change of the generic name of nearly fifty species and subspecies. *Vermivora* is made to replace *Helminthophila*. In respect to *Tiaris*, he follows Dr. Richmond in replacing it with *Euetheia* Reichenbach, 1850, and the group to which *Tiaris* has of late been restricted he renames *Charitospiza*. *Ammodramus* is transferred to the group usually known as *Coturniculus*, and *Ammodramus* is replaced by the new name *Ammospiza* Oberholser, for the *A. maritimus-caudacutus* group.

For such startling revolutions in nomenclature there should be the best of reasons. In determining whether such have been given, the facts in the case may be first stated, as follows: In the year 1827, Swainson published two papers on birds of far-reaching importance in their bearing on nomenclature, and which must be considered together. Unfortunately, through circumstances wholly beyond the control of the author, the paper written last was published first, greatly to the author's regret and disgust, as will presently appear. It is this transposition in the order of publication which gives Mr. Oberholser his excuse for overturning the long-accepted status of the four generic names above-cited.

The first of these two papers, in the order of preparation, is entitled 'On Several Groups and Forms in Ornithology, not hitherto defined.' In this paper 64 genera are either redefined or named and characterized as new, and for 58 of them a type or types (usually a single type) is explicitly designated.

The second paper is entitled 'A Synopsis of the Birds discovered in Mexico by W. Bullock, F. L. S. and H. S., and William Bullock, Jr.,' in which the birds contained in the Bullock Collection were enumerated, the species supposed to be new were described, and the generic names proposed in the first paper, so far as they relate to Mexican birds, were employed.

The first paper was published in the 'Zoölogical Journal,' Vol. III, 1827-1828, and appeared in two parts, the first part (pp. 158-175) in the 'April-July' issue (1827), and the second part (pp. 343-363) in the 'August-November' issue (1827). The exact date of publication is not known, but the two parts may presumably be citable respectively as July, 1827, and November,

1827. The introduction to this paper was dated (*l. c.*, p. 162), "Warwick, 15th Nov. 1826," when, as Swainson himself states later, the manuscript was sent to the editors of the 'Zoölogical Journal' for publication.

During the interval between the transmission of this paper to the 'Zoölogical Journal' and its publication (in the case of the second part, a period of about twelve months), his second paper, on Mexican birds, appeared in the 'Philosophical Magazine' (New Series, Vol. I, 1827), also published in two parts, the first part (pp. 364-369) appearing in the number for May, the second part (pp. 433-442) in the number for June. It is fair to infer that the two parts are respectively citable as appearing in May and June, 1827, or two and six months before the paper on the new genera.

In the introduction to the second paper (*l. c.*, p. 365), Swainson makes the following statement: "The generic definitions will, I hope, shortly appear in another Journal, to which they have been sent with the intention of preceding the publication of this paper, ever since last November. By this unfortunate delay, I am reduced to the unpleasant necessity of referring to a book not yet published, for what the reader should have the immediate power of consulting."

In the case of new species belonging to these genera, fifteen in number, he gave, a reference to the first paper, as follows: "G. [enus] TYRANNULA" (or whatever the name may be), followed by "*Swains. in Zool. Journ. No. 10.*" In eleven of these cases the only species mentioned happened to be the one he had previously designated as the type of the genus.

We have here a case where an author described a number of genera in the most formal way, giving diagnoses of them and specifying their types, but through the earlier publication of a subsequently written paper by the same author,—due to fortuitous circumstances wholly beyond his control, and also greatly to his regret,—some of these genera were first published in association with other species than those he had originally designated as the types. Is it reasonable, or consistent with the best interests of nomenclature, that in such a case an author's plain and deliberate designation of types should be ignored because the genera accidentally became associated, a few weeks earlier, by the

same author, with species not intended as their types? Such a proceeding is contrary to the traditions and usages of systematists in such matters, and quite contrary to the spirit of the *lex prioritatis*, since in determining generic types *where no type is specified*, the author's meaning and intention, if ascertainable are, by common consent, given consideration. How much more then should a strained technicality be waived where an author has distinctly indicated his type species. Does the first association of a specific name with a generic name necessarily determine the species thus mentioned as the type of the genus in question? Ordinarily it most certainly would, but in the present case such a procedure antagonizes and contravenes the purpose of the author in establishing his genus. Viewed from any standpoint of logic, such a proceeding would be in the highest degree absurd.

If no type had been distinctly specified by Swainson, as a part of his diagnosis, for his new genera, it would be necessary to take as the type the first species he associated with them, and in that case his paper on Mexican birds would determine the type for the genera here under special notice. For example, he proposed, among others, the genus *Spermagra* (Zoöl. Journ., III, 1827, p. 346) without indicating a type, but in the paper on Mexican birds he described under this genus the single species *Spermagra erythrocephala*, which thus became of course its type. *Spermagra*, however, is a synonym of *Piranga* Vieillot, 1807, and the species is now recognized as *Piranga erythrocephala* (Swainson).

If some other author had by chance published a paper in which any of Swainson's generic names had been used in connection with a properly designated species, or if Swainson's paper on Mexican birds had been written by some other author and published in advance of Swainson's paper containing his new genera, the case would be different, since under such circumstances the earliest publication would have to be taken. In the apparently unique case of Swainson's two papers, it is far more sensible, and saves serious complications, to accept Swainson's designations of the types of his own genera, as they have heretofore been universally accepted.

There are times, therefore, when the exercise of common sense in the enforcement of even a rigid rule is commendable. The avowed purpose of all rules of nomenclature is to secure stability

in the use of names. It is not for the overthrow of names established by all the safeguards of formality, and as such accepted by all authorities as satisfactory for three-fourths of a century, as in the present instances.

Furthermore, a careful examination of all the facts in the case shows that the conditions in respect to some of the names here particularly under discussion are not quite as represented by Mr. Oberholser in his brief comment on them. In the case of *Xiphorhynchus*, he says: "Although Swainson evidently intended to make *Dendrocolaptes procurvus* Temminck the type of *Xiphorhynchus* [he expressly states that this species is the type], he defeated his purpose by *allowing* the previous publication of *Xiphorhynchus* in combination with the name of a species of *another group*, such publication being quite sufficient to fix the name of a genus. *Since the case is not complicated by the mention of any other species*, *Xiphorhynchus flavigaster* Swainson must be considered the type of *Xiphorhynchus* and this generic term therefore transferred to displace *Dendrornis*."

In the above transcript, I have italicised the points to which I would call attention. It is hardly fair to say Swainson "allowed" this procedure, for he had, under the circumstances, as detailed above, no alternative. The reference to "another group" is also hardly fair, since there was then no "other group" recognized in this connection. At this time many species were grouped by Swainson as congeneric which ten years later he placed in different genera of his own founding.¹ At this time he considered his *X. leucogaster* and *X. flavigaster* as congeneric with *X. procurvus* (Temm.), the species he designated as the type of *Xiphorhynchus*. Hence all the more should regard be paid to his designated types. Again, instead of the case being "not complicated by the mention of any other species," Swainson here described *two* species of *Xiphorhynchus*, *X. leucogaster* and *X. flavigaster*, and Mr. Ober-

¹ In his 1827 paper on Mexican birds, he placed the species of both *Zamelodia* and *Guiraca* all under *Guiraca*; and included under *Agelaius* (= *Agelaius* Vieill.) species of *Agelaius*, *Molothrus* and *Xanthocephalus*; and so on in other cases. This feature of the subject, however, is merely of historic interest, and has, of course, no important bearing on the main questions at issue.

holser has taken the second one in place of the first for *his* type of *Xiphorhynchus*. The first of these species (*leucogaster*) is now referred to *Picolaptes* Lesson, 1831, and the other (*flavigaster*) to *Dendrornis* Eyton, 1852. Thus by the restrictions of other authors, two of Swainson's original species of *Xiphorhynchus* were long since disposed of, *procurvus* of Temminck having been in the mean time conserved, as Swainson originally intended, as the type of *Xiphorhynchus*.

To take the next case, *Vermivora* was evidently the genus to which at this time Swainson would have referred all of the then known species of the present genera *Helminthophila*, *Protonotaria*, *Helinaia* and *Helmitheros*, as they were commonly referred by most authors throughout the next two decades, and he actually thus referred such species of *Helminthophila* as he had occasion to treat in the second volume of the 'Fauna-Boreali-Americana' in 1831. This explains his reference of Wilson's *Sylvia solitaria* to this genus while he designated *Sylvia vermivora* Wilson as its type; and he even goes so far as to credit the name *Vermivora* to Wilson! This under a recently published consensus would necessarily make *Sylvia vermivora* Wilson (= *Motacilla vermivora* Gmelin) the type of *Vermivora*, which thus becomes a pure synonym of *Helmitheros* Rafinesque, 1819, and cannot be revived for the group currently known as *Helminthophila*.

Swainson's *Tiaris* was intended as a comprehensive group, and was so used by various writers up to about 1850, so that it is not strange that Swainson should have included in it a species of *Euetheia*, although he designated a quite different bird (*Fringilla ornata* Wied) as the type. This assignment was respected by all authors till 1902, when Dr. Richmond (Auk, XIX, 1902, p. 87) raised the point that six months before the generic diagnosis was published the name was associated with another species referable to *Euetheia*; to this group he unfortunately proceeded to transfer the name, leaving the original *Tiaris* without a name, which Mr. Oberholser here supplies, calling it *Charitospiza*. Under the circumstances of publication of Swainson's two papers already narrated, this seems, for reasons given above, an unfortunate procedure, which we very much doubt will meet with general acceptance.

Regarding *Ammodramus* Swainson, Mr. Oberholser says: "Since the term belongs to *Coturniculus*, as already shown, another name is required for the group to which the former has been applied, and as there is none such available, it may be called *Ammospiza*," Under *Coturniculus*, on a preceding page, he says: "An earlier name for *Coturniculus* Bonaparte is found in *Ammodramus* Swainson, the real type of which is *Ammodramus bimaculatus* — not, as commonly considered, *Fringilla caudacuta* Wilson (= *Oriolus caudacutus* Gmelin). . . . The forms of this group will be therefore once more in possession of their former generic designation," This case is, as he says, "precisely similar to those of *Xiphorhynchus* and *Tiaris*, since the first use of *Ammodramus* is in the original description of *Ammodramus bimaculatus*, the western continental form of *Ammodramus savannarum* (Gmelin), antedating by several months the publication of an article wherein *Fringilla caudacuta* Wilson is given as the type."

For many years prior to the publication of the first edition of the A. O. U. Check-List (1886) *Ammodramus* was almost universally restricted to the *A. caudacutus-maritimus* group, *Passerculus* and *Coturniculus* being accorded full generic rank, but in this publication they were reduced to subgenera of *Ammodramus*. This step was not approved outside of the American Ornithologists' Union, and its Committee on Nomenclature, recognizing that an error had been made in the treatment of these groups, in 1903 (Auk, XX, July, 1903, pp. 347-350) raised them to the rank of full genera, with, however, some modification as to their constituent species. It is therefore hardly a fair statement to say, as Mr. Oberholser does, that the substitution of *Ammodramus* for *Coturniculus* returns to the species and subspecies of that group "their former generic designation," when in truth *Ammodramus* in the restricted sense has never pertained to them but to the *A. caudacutus-maritimus* group, and the name was used to cover the *Coturniculus* forms only temporarily by a small part of writers on the group. By many writers *Coturniculus* is merged with *Ammodramus* and treated as merely a synonym of it. Even the A. O. U. Committee has recently transferred all the species formerly placed in *Coturniculus*, except the *savannarum* group, to *Ammodramus*, while the latest authorities who accept

Coturniculus as a genus do it with reservation, and by restricting it to the *savannarum* group. Owing to its doubtful status, if for no other reason, it seems ill-advised to uproot *Ammodramus* from its time-honored associations and transfer it to a group of doubtful status, likely at any time, by almost general consent, to be merged with it, for the sake of establishing a new name on a strained technicality. For, as already said above, the accidental first use of *Ammodramus* in connection with the western form of *savannarum* ought not to outweigh the author's deliberate designation of the type of the genus to which he incidentally and without any incongruous transgression of the real relationship of the forms in question, referred another species. If such lapses from propriety and good judgment as Mr. Oberholser here illustrates should secure partial endorsement, the goal of stability in nomenclature will be more distant than ever, for it does not seem possible that such rulings will meet with general acceptance.

GENERAL NOTES.

A Holboell's Grebe (*Colymbus holboëlli*) at Englewood, N. J., in June.— This particular individual was present on an artificial ice pond in Englewood for at least three weeks. It was first seen on June 10 and was seen on three consecutive Saturday afternoons. It disappeared between the 24th and 27th. A trolley line runs along the road to the east of the pond, on the other side of which are some golf links. There is another road on the north bank. Two ice storage houses are on the banks, from which ice was taken on several occasions. A breakwater runs along about fifteen feet from the south bank. The grebe was most often in the center of the pond, though continually swimming all over, sometimes getting inside the breakwater. If near the trolley line when a car came along and startled it, it would take to flight and often make a complete circuit of the pond before alighting again. Automobiles startled it more than the trolley cars. The small fish in the pond formed an abundant food supply. It was not in breeding plumage and may have been a bird born last year. The neck was brown, tinged with reddish, and the throat and sides of the head mouse color. — GEORGE E. HIX, *New York City*.

The Yellow-billed Tropic Bird near Phoenix, Arizona. — In April, 1905, a specimen of the Yellow-billed Tropic Bird (*Phaethon americanus*) was taken alive near Phoenix, Arizona. The bird had dropped in a field from utter exhaustion. The bird, or birds, for there might have been more of them, probably came up by way of the Gulf of California, thence following the Gila River, became bewildered and lost. — GEO. F. BRENINGER, *Phoenix, Arizona*.

Fregata aquila at San Pablo Bay, California. — A specimen of this southern species was shot, June 20, 1905, by P. J. Walsh at Black Point, Marin Co., at the mouth of Petaluma Creek, a tributary of San Pablo Bay. The bird, an immature male, was taken to a local taxidermist where I had the pleasure of examining it. — EDWARD WINSLOW GIFFORD, *California Academy of Sciences, San Francisco, Cal.*

Brant's Nest.—Last April I bought a set of four Brant's (*Branta bernicla leucogastra*) eggs with the nest of Mr. J. S. Warmbath of Washington, D. C. As this is one of the first nests of this bird found, it may be of interest to record it.

Mr. Warmbath accompanied Lieut. Peary's supply ship to Cape Sabine, Ellesmere Land, leaving July, 1899, and returning in October, 1901.

The nest was found, June 17, 1900, on a ledge of rock, 20 feet from the ground among Eider Ducks' and Glaucous Gulls' nests. Both birds were shot.

Mr. Warmbath says: "The Brant's eggs were not incubated, but quite fresh, as I had the pleasure of eating the contents when blown. It was the first taste of any kind of eggs I had had for about twelve months."

The female was shot on a slight elevation above the nest and the male in the water near it. On the same island Eider Ducks and Glaucous Gulls were nesting.

All the islands and the mainland of Buchanan Bay were visited that season, but no other Brant's nest was found. The next year Mr. Warmbath shot several specimens, but found no more eggs.

He has one egg which he secured in Greenland in 1901 and knows of two more secured by Eskimos the same season in Greenland which were turned over to Lieut. Peary.

The eggs are dull creamy white and smaller than the eggs of the Black Brant (*Branta nigricans*). The measurements are as follows: 2.40 inches \times 1.60, 2.30 \times 1.75, 2.30 \times 1.65, 2.40 \times 1.70 inches. — JOHN E. THAYER, *Lancaster, Mass.*

A Brood of Albino Spoonbill Ducks (*Spatula clypeata*). — I am much indebted to Mr. Alex. Calder, taxidermist, of Winnipeg, Manitoba, for a most striking photograph of three mounted Spoonbill Ducks, as white as the driven snow. The most interesting feature is that they all belonged to the same brood. Mr. Calder writes under date of June 16, 1905: "They

were pure white with yellow legs and bills and bluish eyes. I shot them near the Saskatchewan River at a point near Edmonton, in June, 1904. These birds were in a flock of their own species and no white parent duck was noticed during the breeding season. When the birds were some weeks old they were seen by Mr. Grant, a ranchman, who owns the pond near which they were hatched. He saw the young white ducks swimming in the pond, and curious to find out what they were he and another man swam into the pond and caught the ducks, which they distinctly saw diving under the water. When they discovered what they were, Mr. Grant released them and the specimens which I got are the result. There were five birds in all, and I succeeded in getting three of them, two having disappeared the day before I got there." The 'American Field' of Chicago has an albino specimen of this duck in its collection. — RUTHVEN DEANE, *Chicago, Ill.*

Rare Ducks near Bridgewater, Mass.—Ornithologists may be interested to know that Mr. Daniel B. Davis on Oct. 22, 1904, at Lake Nipnickett, Bridgewater, Plymouth Co., Mass., shot a Shoveller (*Spatula clypeata*). This bird, together with a number of others of different species, was about to be disposed of in ordinary ways when fortunately Mr. Joseph E. Bassett identified and purchased it.

Other interesting captures at this lake are as follows: Two specimens of the Ring-necked Duck (*Aythya collaris*), by Joseph E. Bassett. Nov. 20, 1895. A King Eider (*Somateria spectabilis*), Oct. 21, 1899, also by Joseph E. Bassett. Two Gadwalls (*Chaulelasmus streperus*), Oct. 18, 1901, by Mr. Harry P. Sturtevant.

With the exception of one of the Ringnecks the skins of the above are in the writer's possession. — ARTHUR C. DYKE, *Bridgewater, Mass.*

Rallus elegans and Isonornis martinica in Massachusetts.—While examining recently the collection of bird skins of Mr. Alfred Hill of Belmont I was interested to find among them a male King Rail (*Rallus elegans*) which was taken Dec. 30, 1896, at Cambridge, and which furnishes the first record of the species for the vicinity. The bird was caught on the ice of a small pond in the Fresh Pond marshes. It was in good plumage but was much emaciated and died in the night following the day of its capture.

I am indebted to Dr. L. C. Jones of Malden for the information that there came into his possession in April, 1902, a fine male Purple Gallinule (*Isonornis martinica*) which was shot at Sandwich by John McArdle, a local gunner. — J. A. FARLEY, *Boston, Mass.*

The Ruff at Camden, Maine.—I wish to record the capture of a female Ruff (*Pavoncella pugnax*) at Camden, Maine, Sept. 14, 1900, by Mr. Sidney Clark. This skin I purchased of Charles K. Worthen, Warsaw, Ill. — JOHN E. THAYER, *Lancaster, Mass.*

The California Partridge (*Callipepla californica*) in Los Angeles County, California. — In the A. O. U. Check-List for 1895, the range of this species is given as : "Coast region of California, south to Monterey." Mr. H. S. Swarth sent me some time ago several specimens of partridges, which he labelled *Callipepla californica vallicola*, and among them there is a typical *californica*. It was taken at San Fernando, Los Angeles Co., Cal., on Oct. 1, 1901, and is No. 2152 of Mr. Swarth's catalogue. This record extends the range of this partridge about 250 miles to the southward.— ARTHUR T. WAYNE, *Mount Pleasant, S. C.*

The Ruff (*Pavoncella pugnax*) in Indiana.— The celebrated Kankakee Marshes at English Lake, Indiana, have yielded records of several specimens of the English Widgeon, but I can now record the capture of a still rarer visitor from the Old World, the Ruff. While visiting the English Lake Shooting and Fishing Club on April 12, 1905, I examined a number of ducks and shore birds which had been killed that day by Mr. Wm. M. Derby, Jr., of Chicago. The latter consisted principally of Summer Yellow-legs and Pectoral Sandpipers, but there was one specimen in the bag which puzzled me. Mr. Derby had been hunting ducks in the marsh, and while moving from one point to another he fired into a flock of shore birds which flew past his boat, killing several "grass birds" and the specimen in question. Mr. Derby very generously presented me with the bird, and after comparing it with several descriptions I felt assured as to its identity, but I am under obligations to my brother, Walter Deane, and Dr. Chas. W. Richmond who, after comparing the skin with other specimens captured in North America, in the collections of William Brewster and the Smithsonian Institution, pronounced it a typical Ruff, though, as is so characteristic with the species, they differ somewhat in size and plumage. The specimen was in moult, pin feathers being conspicuous on the head and neck. On dissection it proved to be a male, though the testes were but slightly developed. As a matter of reference I append (p. 411) as complete a list of all North American captures as I have been able to find.

Dr. Richmond writes me that one of the specimens recorded by Boardman in his list of 1862, "one or two instances," is in the Smithsonian Collection. This is probably the first record for North America. In his 'Catalogue of Canadian Birds,' Pt. 1, p. 177, 1900, Mr. John Macoun records two specimens, a male and female, shot on Toronto Island, Ont., but Mr. J. H. Fleming informs me that the female proves to be a Bartramian Sandpiper. Mr. Macoun is also in error in giving the date of capture of the male as 1875, for it was taken in 1882, and is so recorded in 'The Auk,' Vol. II, p. 336, 1885, when at that time in the collection of Mr. John Young of Toronto, Ont.

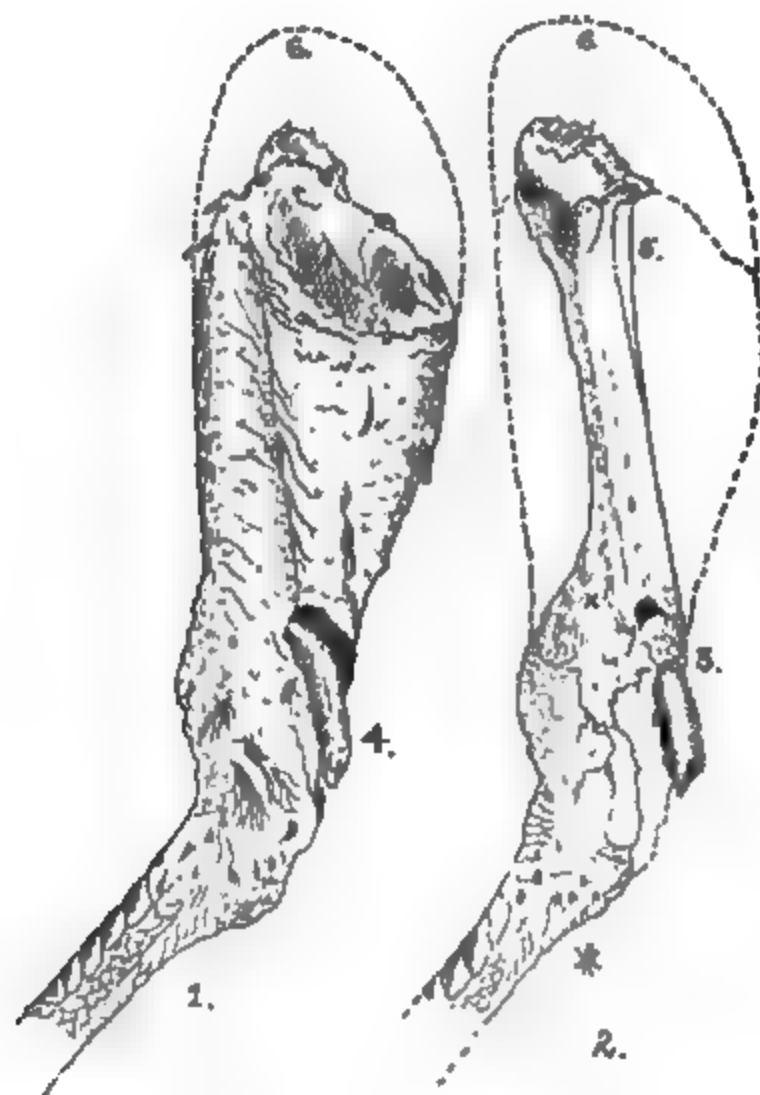
North American Records of the Ruff.

Sex.	Locality.	Date.	In Collection of	Reference.
♂	Grand Menan, N. B.		U. S. National Museum	'Cat. of the Birds found in the vicinity of Calais, Me., and about the Islands at the mouth of the Bay of Fundy,' Geo. A. Boardman, Proc. Boston Soc. Nat. Hist., Vol. IX, 1862.
♀	Barnaget, N. J.		Am. Mus. Nat. Hist., N. Y. (formerly in the D. G. Elliot Coll.)	Birds Known to occur within Fifty Miles of New York City, F. M. Chapman, p. 35, 1894.
♂	Long Island, N. Y.		Am. Mus. Nat. Hist., N. Y. (formerly in the G. N. Lawrence Coll.)	Birds Known to occur within Fifty Miles of New York City, F. M. Chapman, p. 35, 1894.
♀	Long Island, N. Y.	May 18, 1868	Am. Mus. Nat. Hist., N. Y. (formerly in the G. N. Lawrence Coll.)	Birds Known to occur within Fifty Miles of New York City, F. M. Chapman, p. 35, 1894.
♀	Scarborough, Me.	Apr. 10, 1870	Everett Smith, Portland, Me.	Forest and Stream, Vol. XX, p. 85, 1883.
♀ ad.	Newburyport, Mass.	May 20, 1871	Wm. Brewster, Cambridge, Mass.	Am. Naturalist, Vol. VI, p. 306, 1872.
♂ juv.	Licking Reservoir, Ohio.	Nov. 10, 1872	Ohio State University	Bull. Nutt. Orn. Club, Vol. II, p. 83, 1877.
♀ juv.	Upton, Me.	Sept. 8, 1874	Wm. Brewster, Cambridge, Mass.	Bull. Nutt. Orn. Club, Vol. I, p. 19, 1876.
♂	Columbus, Ohio.	Apr. 23, 1878	Ohio State University	Birds of Ohio, Lynde Jones, p. 217, 1903.
♂ juv.	Chatham, Mass.	Sept. 11, 1880	Brookline High School (formerly in the Gordon Plummer Coll.)	Forest and Stream, Vol. XV, p. 186, 1880.
♂ juv.	Toronto Island, Ont.	Spring of 1882	Mus. Geol. Surv. Can., Ottawa, Ont.	Auk, Vol. II, p. 336, 1885.
♀	Raleigh, N. C.	May 6, 1892	Wm. Brewster, Cambridge, Mass.	Auk, Vol. IX, p. 299, 1892.
♂ ?	Cole Harbor, near Halifax, N. S.	May 27, 1892	Wm. Brewster (loaned by Thos. J. Egan, Halifax, N. S.)	Auk, Vol. XXII, p. 410, 1905.
♀ juv.	Alexandria Co., Va.	Sept. 3, 1894	Wm. Palmer, Washington, D. C.	Auk, Vol. XI, p. 325, 1894.
♀	Camden, Me.	Sept. 14, 1900	John E. Thayer, Lancaster, Mass.	Auk, Vol. XXII, 409, 1905.
♂ juv.	English Lake, Ind.	Apr. 12, 1905	Ruthven Deane, Chicago, Ill.	Auk, Vol. XXII, p. 410, 1905.

RUTHVEN DEANE, Chicago, Ill.

A Broken Pigeon's Leg that Healed Itself. — The accompanying sketch shows a remarkable case of healing in a Pigeon's (*Columba*) leg. After the removal of the feathers, the tibia was seen to have been broken, and its sharp end pushed out through the flesh. The leg, however, was perfectly strong, though nearly half an inch shorter than the other. The protruding bone was in an advanced stage of decay, but the surrounding wound was perfectly healthy.

It was evident after removing the flesh that the protruding portion of the tibia would have soon dropped off, with the wound entirely healed,



Leg of Pigeon (*Columba*), showing healed fracture.

1. Leg with the feathers removed, 2. leg with the flesh removed; 3. decaying bone, 4. end of the tibia protruding through the flesh, x. point where knitting took place, 5. fibula; 6. original length of the leg

which would have left from the exterior little indication of the broken limb. The slight swelling on the anterior edge of the bone alone would have suggested a fracture beneath. In the region of the healing the periosteum was perfectly smooth, continuous, and sound.

A few years ago I detected a similar healing in a Yellow Warbler's (*Dendroica aestiva*) leg. Is there any need for us to suppose that birds need "mud" settings for their broken limbs, when nature unaided accomplishes such perfect mends? — REGINALD HEBER HOWE, JR., *Concord, Mass.*

Turkey Vulture (*Cathartes aura*) in Michigan.— A bird of this species was shot by Samuel Kennedy in Atlas township, Genesee Co., Mich., about April 27, 1905, near the Medbury Farms. I examined this bird later. Resident hunters inform me that this is the first bird that they have ever known to have been taken in the vicinity. Personally I have never observed it in my visits in the county, which have extended since 1901. Mr. Samuel Shicer records a bird shot near Goodrich, five miles south of Atlas, on October 10, 1888 (O. & O., 1889, p. 43). — BRADSHAW H. SWALES, *Detroit, Mich.*

The Turkey Vulture in Western Massachusetts. — A young Turkey Vulture (*Cathartes aura*) was captured by Walter Stanley in Becket, a town in Massachusetts, thirty-five miles west of Springfield, June 8, 1905. The bird was observed in a field eating a dead lamb, and was then killed and sent to the Museum of Natural History in this city. — ROBERT O. MORRIS, *Springfield, Mass.*

The Gray Gyrfalcon in Wisconsin. — On Nov. 27, 1904, Fred Dean, a young hunter of this city, brought me a fine specimen of this bird, which is now No. 5777 of my collection of North American birds.

He shot it that forenoon, as it flew swiftly by him at a long range distance. The place was near an island known locally as Skunk Island, the bird at the time flying over a nearby marsh. The bird proved to be a young female.

Having handled Gyrfalcons when in Alaska I at once so named the specimen, and reference to descriptions of the bird in various works on ornithology further strengthened my belief. However, that no error might be possible I decided to have it examined by some authority, so it was sent on July 3 of the present year to Dr. Merriam of the Biological Survey. Dr. Merriam being at that time in the West the acting chief, Dr. A. K. Fisher, turned it over to Prof. Robt. Ridgway of the Smithsonian Institution, who examined it, labelled the bird *Falco rusticola* juv., in his own handwriting, and returned it to me. So there can be no doubt whatever of its identity.

That it is a rare capture for Wisconsin seems beyond doubt. Dr. King, in his list of Wisconsin birds published in 'Geology of Wisconsin,' Vol. I, makes no mention of it. Kumlien and Hollister in their 'Birds of Wisconsin' (Bull. Wis. Nat. Hist. Soc., Vol. III, Nos. 1-2-3), make no mention of the species. Nor can I, in any work at my command, find any specific mention of another capture or record of any nature for this State.

In the last mentioned work, on page 132, may be found a statement that "some species of gyrfalcon has been credited to the fauna of Wisconsin in an early day, a thing by no means impossible or unlikely ; but there is no actual record obtainable at present." Further it states there was one at Oshkosh, said to have been killed near Lake Winnebago. We have no intimation what became of this specimen nor any *proof* that it even *was* a gyrfalcon.

In view of these facts I do not hesitate to say that my bird constitutes the first actual record for Wisconsin.—W. E. SNYDER, *Beaver Dam, Wis.*

Northern Pileated Woodpecker in Massachusetts.—During a trip to the Berkshire Hills early in June for the purpose of seeing birds of that region, while walking up Greylock on the morning of June 7, 1905, we heard the harsh call of the Northern Pileated Woodpecker (*Ceophlaeus pileatus abieticola*). The bird flew over the road and settled on a large dead tree trunk at quite a distance, where, guided by his hammering, we found a fine male at work three feet from the ground. We had good views of him then at close range and as he flew away. I was very glad that this beautiful woodpecker of the wild forests should still remain a resident of Massachusetts.—LIDIAN E. BRIDGE, *West Medford, Mass.*

A Rare Plumage of the Ivory-billed Woodpecker (*Campephilus principalis*).—A superb specimen of this magnificent woodpecker, which I obtained on February 19, 1894, in Jefferson County, Florida, has the ends of all the longer primaries (except the 3d and 4th) pure white. This specimen is an adult male in very high nuptial plumage, and is No. 3002 of my register. An adult female, which also was taken in Jefferson County, closely resembles the above male in the peculiar pattern of the primaries.

From a series of many specimens that I collected in different parts of Florida in the years 1892, 1893, and 1894, the two birds above described are the only ones, as far as I can recall, that were marked peculiarly as regards the longer primaries.—ARTHUR T. WAYNE, *Mount Pleasant, S. C.*

The Prairie Horned Lark (*Otocoris alpestris praticola*) on Mount Washington, N. H.—I have lately spent thirteen days (July 7–19, 1905) at the summit of Mount Washington, where I was surprised to find two Prairie Horned Larks at home in or near what is known as the Cow Pasture, a comparatively level, sedgy, boulder-besprinkled place far above the tree line. One or both of the birds was seen and heard daily (usually twice a day—forenoon and afternoon) up to the 16th. On two occasions one was seen with its mandibles loaded with what seemed to be insects, and in general their behavior was such as to make it all but certain that they were breeding near by; but all my attempts to find the nest were unsuc-

cessful. On the 18th and 19th I failed to see them, perhaps because on both days an extremely high wind was sweeping across the 'pasture.' Possibly they had been driven away, with their young, by the sight and sound (and smell) of the racing automobiles, which from the 16th to the 19th had possession of the mountain road! The species has been recorded from several valleys in the White Mountain region, but, so far as I know, not from Mount Washington or any similar locality. — BRADFORD TORREY, *Wellesley Hills, Mass.*

The Pine Siskin Breeding at Guelph, Ontario. — During the past winter (1904-1905) the Pine Siskin (*Spinus pinus*) was abundant in the vicinity of Guelph, Ont. After the middle of April no flocks were noted but they were still commonly seen in pairs or groups of three or four individuals.

All through May they were common and were breeding throughout the county of Wellington. Some ten nests were found, all in white spruces, black spruces, or balsams.

The first nest for Central Ontario was found in Guelph on May 7, 1905, by Mr. F. Norman Beattie (Bull. Mich. Orn. Club, Vol. VI, Nos. 1-2). Our only previous Ontario records were for the vicinity of Ottawa where Mr. Sarneau has taken seven nests. — A. B. KLUGH, *Guelph, Ont.*

The White-throated Sparrow Breeding in Eastern Massachusetts. — On nine different days, from June 29 to August 6 of the present year, I heard a White-throated Sparrow (*Zonotrichia albicollis*) singing at the same locality in Boxford, Essex Co., Mass., and on several occasions I saw the bird plainly and fully identified it — once when in company with Dr. C. W. Townsend. I was unable to find the female or the nest, but on August 20 I saw at the same place two young birds of this species in the juvenal plumage with speckled breasts, one of them having the tail imperfectly fledged. They were alone while I watched them and were evidently able to shift for themselves. The finding of the young at this time and place and in this plumage seems to establish the fact of the breeding of the bird here. Messrs. Howe and Allen's List cites but two breeding records of this species for eastern Massachusetts — Browne, Bulletin N. O. C., Vol. V, p. 52, of a nest found in Framingham, 1879, by Mr. C. E. Haeuber, and Torrey, Auk, Vol. V, pp. 426, 427, of a pair observed for several days at one locality in the breeding season of 1888, in the town of Wakefield, the latter not being a "breeding record" strictly speaking. What gives the matter additional interest is the fact that on June 4, at a locality a quarter or half mile distant from that of the bird above-mentioned and also in the town of Boxford, I had previously heard the song of a White-throated Sparrow, but though I visited the place often thereafter I did not hear it again until July 2, when I heard it delivered two or three times and once very distinctly. This song was entirely different from that of the bird of the other locality, being one of

the commoner forms, while that was individual and quite unique in my experience. This convinces me that two male White-throated Sparrows passed the breeding season here, and suggests that the nesting of this species in Essex County may be something more than accidental. It is not easy, however, to account for the fact that the latter bird was heard but twice. I may also add that the two localities mentioned are separated by thick woods, and that two or three roads intervene. According to Mr. G. M. Allen's List of the Birds of New Hampshire, *Zonotrichia albicollis* has not been found breeding in the eastern part of that State south of Lake Winnepesaukee. The region about Boxford has a slight Canadian tinge, *Vireo solitarius*, *Helminthophila rubricapilla*, *Dendroica blackburnia*, and *Hylocichla guttata pallasii* being found there in the breeding season.—FRANCIS H. ALLEN, *West Roxbury, Mass.*

Nesting of Henslow's Sparrow in St. Clair Co., Michigan.—The existence of Henslow's Sparrow (*Coturniculus henslowii*) as a summer resident, in Sections 1 and 36, Clay township, St. Clair County, Michigan, was reported to me by an eastern ornithologist in 1900, but as his observations were made from a passing electric car I regarded his identifications as doubtful. However, when Messrs. Swales and Taverner visited this locality on June 18, 1904, and found the birds common I determined to try for a set of their eggs. As I stepped from the car on May 28, 1905, and glanced over the vast expanse of marshy meadow land the prospect looked anything but promising, especially as I believed the birds would not flush from their nests but slip quietly away, and this was the case. Five hours of careful search revealed but one nest. This was in a lower portion of the meadow, where the ground was so wet that a foot impression quickly filled with water, but scattered about were numerous hummocks elevated a foot or two above the general level. The nest was on the side of one of these and skillfully concealed in a thick growth of marsh grass. It was composed entirely of fine dry grasses and contained four slightly incubated eggs. As these were warm I concluded the bird had glided away at my approach, so I retired about fifty yards, and after waiting fifteen minutes made a quick dash and surprised her on the nest. She was so startled that she flew a long distance before dropping into the grass.

Two days later, while crossing what is known as the 'Black Marsh,' in the village of Grosse Pointe Farms, Wayne County, I was surprised to hear a Henslow's Sparrow singing, and soon located him on a weed top. As I made toward him the female flushed at my feet but not from a nest. I could spare no time that day but returned on June 8 and found the entire territory under water, the heaviest rainfall on record here having occurred a few days previous. However, I waded over the whole marsh and counted twelve pairs of the birds, and doubtless a number escaped notice.—J. CLAIRE WOOD, *Detroit, Mich.*

Cassin's Sparrow in Colorado.—On May 27, 1905, I took a female Cassin's Sparrow (*Peucaea cassinii*) near Springfield, Baca County, Colorado, to the best of my knowledge the first to be taken in the State, although it was expected that it would be found sooner or later. The bird was perched on a barbed-wire fence on the prairie near Cat Creek, about a mile south of the town. Its breast was quite bare of feathers, so that it may have been incubating. Springfield is about thirty miles from both the east and the south boundaries of the State.—EDWARD R. WARREN, *Colorado Springs, Col.*

The English Sparrow at Tucson, Arizona.—The English Sparrow (*Passer domesticus*) has made its appearance in Tucson, Arizona.—GEO. F. BRENINGER, *Phoenix, Arizona.*

The Orange-crowned Warbler (*Helminthophila celata*) a Winter Resident in South Carolina.—In 'The Auk,' III, 1886, 139, I recorded this warbler as occurring on the coast of South Carolina, from November to March. Prof. W. W. Cooke states in his article 'The Winter Ranges of the Warblers' (Auk, July, 1905, p. 297) that *H. celata* "occurs in migration" and is "rare or accidental" in the southeast United States, but that it does *not* winter.

This latter is certainly a "loose statement," as the Orange-crowned Warbler *winters abundantly* on the coast of South Carolina and it arrives from the northwest the last week in October and remains until the first week in April, or perhaps even later. The center of abundance of these warblers is on the coast islands, as the greater part of these islands are veritable jungles, which the Orange-crowned Warbler delights to inhabit. I have also taken this warbler in the winter in different parts of Florida, such as the Suwannee and Wacissa River regions.

The Orange-crowned Warbler is capable of enduring intense cold. I have seen numbers of these highly interesting birds near Charleston when the thermometer ranged as low as 8° above zero. While in South Carolina, these warblers are partial to thickets of lavender and myrtle bushes. ARTHUR T. WAYNE, *Mount Pleasant, S. C.*

Brewster's Warbler (*Helminthophila leucobronchialis*) at Englewood, N. J.—On May 13, Dr. Wm. Wiegmann, Carleton Schaller and I found a typical Brewster's Warbler at Englewood, N. J. It was with a flock of other warblers in an American elm pecking at the fruit (samaras). It was only a migrant, as it was not seen again, although I went to the same place the next day. The following description was written in the field. Above uniform pale grayish blue; anterior half of crown dull yellow; a black streak through the eye; superciliary line whitish; malar region hoary grayish; entire lower parts white, sides and flanks plumbeous, the latter color encroaching upon the breast; middle and greater wing-coverts tipped with yellow forming two beady wing-bars, more

extensive on the greater coverts; wings and tail olivaceous dusky, the outer tail-feathers with white inner webs; bill black; feet dark. It was perfectly silent.—GEORGE E. HIX, *New York City*.

Myrtle Warbler at Cape Elizabeth, Maine, in January, 1905. — In 'The Auk' for July, 1904, I gave data of the Myrtle Warbler (*Dendroica coronata*) wintering at Cape Elizabeth. During the past winter I watched the place closely to see if the birds would winter there again. A flock of six, at least, was seen there on Christmas day, 1904, but no more were observed until January 15, 1905, when two were seen in the same locality, about half a mile from where the birds lived in the winter of 1904-1905. January 29, two Myrtle Warblers were seen in the same field. After that the place was visited on several occasions, but not a warbler was seen during February. A Northern Shrike, however, made a stopping place there, and it may be that he had something to do with the absence of the warblers. April 16, one Myrtle Warbler was seen, in full breeding plumage, only two hundred yards from the locality, and I am inclined to think it was one which had wintered there, as not a single individual of the species had been seen in migration up to that date, and it was ten days or more before migrant Myrtle Warblers began to make their appearance.—W. H. BROWNSON, *Portland, Maine*.

Water-Thrush (*Seiurus noveboracensis*) Nesting in Lancaster, Massachusetts. — On May 21, 1905, Herbert Parker, Esq., Dr. Ernest Codman, A. E. Harriman and I visited a spruce swamp in the northern part of Lancaster. This swamp covers an area of about forty acres. It is filled with fairly good-sized spruce trees. There are a great many old up-rooted trees throughout the swamp. Calla lilies (*Calla palustris*) are very abundant and there is a great quantity of rhodora (*Rhododendron rhodora*) in the openings.

After tramping for awhile, listening to *Dendroica virens*, *D. maculosa*, *D. pensylvanica*, *D. Blackburnia*, *D. caerulescens*, *D. coronata*, *Mniotilta varia*, and *Compsothlypis a. usneæ*, Mr. Parker said he heard the song of a Water-Thrush (*Seiurus noveboracensis*). We all went to the spot. The bird was in full song; but even then we never suspected that it was nesting. After going a short distance, looking over each up-rooted tree as a matter of form, Harriman flushed a bird out of an up-rooted stump and looking down, discovered the nest with five eggs. The bird was very tame and remained close by her nest, moving her tail up and down like a Spotted Sandpiper (*Actitis macularia*). I told him to shoot her, which he did.

On examining the root we found an old nest a little above the present one, which the bird had evidently used last year. The eggs of this set proved to be nearly three quarters incubated.

Not over two hundred yards from the first nest, Dr. Codman flushed another bird from her nest, which contained five eggs. This nest was

not in an up-rooted tree but sunk in a bank only a few inches from the ground. The bird was extremely tame. She kept moving her tail up and down every step she took. We all sat down not over ten feet from the nest and watched her. After waiting a few moments she went back on her nest. If I had had a camera I could have taken a most interesting picture. I could almost put my hand on her. After a consultation we all agreed that it would be a needless waste of life to shoot her, as we already had secured one bird. We were absolutely positive as to the identity of this one.

The eggs were incubated as much as the first set.

Mr. Wm. Brewster has seen both sets and has identified the bird.—
JOHN E. THAYER, *Lancaster, Mass.*

The Louisiana Water-Thrush in Philadelphia in Summer.—On June 14, the only day this year, so far, that I have hunted on the Wissahickon Creek, I found two birds of this species (*Seiurus motacilla*) on the left bank of that stream, just above the Valley Green Hotel. With beaks full of food they chirped continually in protest at my presence, and altogether showed plainly that they had young in the immediate vicinity.

A nest recorded by Mr. H. K. Jamison (O. & O., 1891) is the only other breeding record inside the city line with which I am acquainted. It, also, was on the Wissahickon. — CHARLES H. ROGERS, *Crosswicks, N. J.*

The Redstart (*Setophaga ruticilla*) a Resident in Dominica, West Indies.—In a letter dated Barbuda, April 8, 1905, Mr. H. G. Selwyn Branch writes me that the Redstart is a resident in the island of Dominica, and that he has observed it building its nest there. From this it may be inferred that the bird breeds in the island, a locality very far south of its breeding range as now understood. — AUSTIN H. CLARK, *Boston, Mass.*

The Black-fronted Warbler (*Dendroica auduboni nigrifrons*) in Southern California.—I have an adult male of this species in breeding plumage taken on April 1, 1901, by Mr. H. S. Swarth, at Los Angeles, California. The specimen is marked *Dendroica auduboni*, but upon comparing it with several males of *D. a. nigrifrons* in breeding plumage taken late in May and June in the Huachuca Mountains, Arizona, I find that the Los Angeles specimen is much more richly colored. As far as I am aware, this subspecies has not been before reported from California. — ARTHUR T. WAYNE, *Mount Pleasant, S. C.*

Young Birds Killed by Trains.—On June 13, 1905, Mr. B. W. Griffiths and the writer were walking along the tracks of the Downingtown and Lancaster Branch of the Pennsylvania Railroad near Honeybrook, Chester County, Pa. Inside of a mile we picked up two dead birds from between the tracks—a young Vesper Sparrow, and a young Purple Grackle. The whole side of the grackle's head was torn off, but I could find no marks upon the sparrow.

Several days later, on the Wilmington and Northern tracks near the same place, I picked up a young Grasshopper Sparrow—also dead but without a mark. All three of these birds were in the juvenile plumage and of about the same age—just beginning to use their wings. Does it show lack of intelligence on the part of the young bird? I believe a great many are killed this way every year and I have never found an adult bird that had been killed by a train.

I believe it is due more to their weak flight than to anything else. They get near the tracks and the suction caused by the passing train draws them beneath it, their wings being too weak to resist the strain. — CHRESWELL J. HUNT, *Philadelphia, Pa.*

Some Massachusetts Records of Interest.—During the past year I have noted several birds of some interest in this region.

Late fall migrants, 1904, include:

Empidonax minimus, Chebec, Concord Turnpike, Lexington, Oct. 2, one.

Dendroica maculosa, Magnolia Warbler, Waltham, Oct. 9, one.

Dendroica striata, Blackpoll Warbler, Cambridge, Nov. 7, one.

An interesting winter record is *Euphagus carolinus*, Rusty Blackbird. Concord Turnpike, Concord, Jan. 22, 1905, one.

Early spring migrants, 1905, include:

Butorides virescens, Green Heron, Charles River, Needham, Apr. 9, one.

Zonotrichia leucophrys, White-crowned Sparrow, Hobb's Brook, Lexington, May 4, one.

Coccyzus erythrophthalmus, Black-billed Cuckoo, Rock Meadow, Belmont, May 4, one.

Other records of interest, 1905:

Oidemia deglandi, White-winged Scoter, one male, Arlington, Spy Pond, May 9.

Bartramia longicauda, Bartramian Sandpiper, Ipswich River, North Reading, May 13, one.

Icterus spurius, Orchard Oriole, Ipswich, May 28, one male.

Vireo noveboracensis, White-eyed Vireo, Ipswich River, South Middleton, June 9, one.—ARTHUR C. COMEY, *Cambridge, Mass.*

Notes from Northwestern Connecticut.—*Otocoris alpestris praticola*.—On May 25, 1905, I secured a pair of these birds in a meadow on the crest of a low ridge about eight miles south of the village of Litchfield. They undoubtedly had a nest there, for they both had been seen in the same meadow the preceding day, and the thin skin of the belly of the female indicated that she probably had a brood. Both were very shy, which I have not found to be the case with these birds later in the season. I believe that this is the first breeding record for the State of Connecticut.

Helminthophila peregrina.—It may be of interest to note that the

Tennessee Warbler was almost common in the *village* of Litchfield during the nine days from May 19 to 27 inclusive this last spring. Litchfield is situated on a high ridge, along the crest of which runs the main street, bordered with tall elms. To these trees and to those in the grounds about the houses close to the street the birds seemed to be restricted; for though I was in the field every day throughout the migration, I did not see or hear one outside of the village. I secured five on different days within that time out of one tree in our own grounds, and heard or saw several others in the neighboring yards. — EDWARD SEYMOUR WOODRUFF, *Litchfield, Conn.*

Two Records for Colorado.—FLICKER. *Colaptes auratus*.—Oct. 24, 1904, I obtained in Hall Valley, Park Co., Colorado, a specimen of the eastern Flicker showing not a trace of hybridization with the Red-shafted Flicker. This is the first record for this bird in our State at such an altitude, this specimen being taken at an altitude of 10,000 feet.

CANVAS-BACK. *Aythya vallisneria*.—July 4, 1900, I found near Barr Lake, Adams Co., Colorado, a set of eleven eggs of the Canvas-back. The eggs were fresh. This is the first record I believe for this bird's breeding in our State.—A. H. FELGER, *Denver, Colo.*

Colorado Notes.—The Wood Thrush (*Hylocichla mustelina*) may now be added to the Colorado avifauna. It is reported by Miss Jennie M. Patten at Yuma, Colo., one specimen being seen on May 27, 1905, under such circumstances that identification was easy and certain. She also reported a Cardinal (*Cardinalis cardinalis*), but afterwards discovered that it was an escaped cagebird. The same observer reports two Red-eyed Vireos (*Vireo olivaceus*) at the same station on May 27, 1905, and afterwards. Colorado records for this species are meager. Also Baltimore Orioles (*Icterus galbula*) in 1903 and May 22 and 23, 1905.

I watched a Blue-gray Gnatcatcher (*Polioptila caerulea*) for some time at short range near Boulder on May 12, 1905. This is the first record north of Denver in Colorado, so far as I am aware. Bobolinks appeared again this year in some numbers east of Boulder, from which the inference is warranted that they are regular visitants, unnoted until last year.

A male House Finch (*Carpodacus mexicanus frontalis*), assisting his mate in raising a family of five nestlings under the roof of our front porch, confirms a long cherished suspicion that lack of red plumage does not always indicate immaturity. His plumage appears to be almost exactly like that of the female. He sings a great deal, with the full song of the male, though at first the song seemed a little weak—perhaps a mere fancy engendered by the apparently immature plumage. He had several fights with a highly colored male when nest building first began, and his mate then fought more valiantly than he did.

Songs of Female Birds.—Ornithological literature seems to say very little about the nesting songs of female birds, or I have been unfortunate

in my quest for information upon the subject. When a friend, some years ago, told me he had closely watched a female Black-headed Grosbeak (*Zamelodia melanocephala*) on the nest singing as heartily as the male, I was quite skeptical, but am now inclined to believe him, except that he may have exaggerated the quality of the song. Last year I asked a number of western ornithologists if they had noticed the nesting song of the female House Finch (*Carpodacus mexicanus frontalis*) and was answered in the negative, yet it has a distinct, well defined song in Boulder, Colorado, at least, and it is not likely to differ in this respect elsewhere. I have watched several pairs about my home and vicinity, and in every instance have found the same song. It is an exact repetition of the first part of the male's usual song, from two to six notes, cut short at the end and repeated over and over in great excitement, the performance continuing thus for some moments at a time, often for a quarter or half hour. In each instance this has been a daily occurrence from the time the last egg was laid until after the young birds left the shell, generally while the bird was on the nest, though sometimes while in the vines or on the housetop, the male often joining in with the full song, making a remarkable duet. The tones can scarcely be distinguished from those of the male after a few days of practice. The excitement of the bird during these concerts is something that must be seen to be appreciated, increasing from day to day until the hatching of the eggs causes so much work that vocal efforts are neglected.

Denis Gale. — The name of Denis Gale will bring to the mind of many ornithologists, particularly those who have worked in the mountains of Colorado, the picture of an elderly gentleman whose energy in bird study knew no bounds, who was willing to brave wind and heat and cold and storm in his tramps from valley groves to snow-clad mountain crests in the interests of ornithology, whose collections have helped enrich the splendid collections of the Smithsonian Institution, and whose notes were of great assistance to Capt. Bendire and others, for Mr. Gale, while always willing to furnish information to others, was not much given to publishing his observations himself. Failing health stopped his work several years ago, and a few months ago he passed to his eternal rest in Denver. It will no doubt interest ornithologists to know that through the generosity of Mr. Simon Guggenheim, all of Mr. Gale's collections not heretofore sent to the Smithsonian Institution are now deposited in the museum of the University of Colorado, at Boulder, including his valuable notes on migration, food and nesting habits, covering a period of more than ten years in the mountains. The notes are now being transcribed, annotated and indexed by the undersigned, so as to make them available for the use of bird students visiting the University. It occurs to me that a note of this in 'The Auk' would be appreciated by those who are familiar with Mr. Gale's work. — JUNIUS HENDERSON, *University of Colorado, Boulder, Col.*

Some Wayne County, Michigan, Notes, 1905. — *May 7.* — Secured a Golden-crowned Kinglet (*Regulus satrapa*) afflicted with a tumorous growth, about the size and shape of a marble and completely surrounding the tarsus. It is many years since I observed a similar morbid growth on a bird. The other example was a Chipping Sparrow (*Spizella socialis*). This was also a globular enlargement of the tarsus about the size of a walnut, and so heavy that the bird could no longer rise from the ground. There was no distinctive difference in the two above cases, except the size, and I would not term the malady a malignant development, as it appears as an independent growth in no way directly affecting the vital forces. Indirectly, however, it probably causes death by assuming a size and weight that retards the bird from obtaining necessary nourishment.

May 21. — Secured an adult female American Redstart (*Setophaga ruticilla*) with abnormal development of mandible, which was bent upward along the side of the maxilla so that the tip projected slightly above the culmen ridge. There were no notches where the mandible and maxilla crossed, as seems to be the case when similar malformation occurs with hard-billed birds. This bird was in perfect physical condition and was conveying nest material when secured, thus showing that the abnormality was not an impediment to securing food or a mate.

June 6. — Made the acquaintance of a Catbird (*Galeoscoptes carolinensis*) that deserves a pension. When first noted she was attacking a large female moth, *Attacus cecropia*. When struck the moth would flutter its wings, which caused the catbird to jump back as if expecting a counter blow. She gradually became bolder, however, and finally conveyed the prize to her nest of young in a neighboring spruce. Shortly after she was dancing about a *Sphinx tiliæ*, but this I took away from her to adorn my 'den'! Finally I was near the nest when she brought a male *A. prometheus*.

June 11. — Caught a Green-crested Flycatcher (*Empidonax virescens*) on her nest containing three eggs. As a rule one does not even see this flycatcher on the nest. She almost invariably observes you first and quietly leaves. This nest was near the end of a horizontal elm branch and about two feet higher than I could reach. I pulled the branch down until I could get hold of her tail. She did not show much interest until I gave this appendage a gentle jerk. She then moved her head quickly from side to side and finally stretched out her neck and peered down at me, but did not leave until I repeated the operation several times. The eggs were infertile and entirely unspotted and everything suggested some form of physical debility. I did not really catch her but held her tail very gently so as not to deprive her of it as she started away, but from what I saw of her at close range, and her actions later, I think she was a very old bird, nesting a season beyond her time.

July 9. — Collected an adult male Golden-winged Warbler (*Helminthophila chrysoptera*) in slightly abnormal plumage. The uniform slate-gray of the upper parts, together with yellow of forehead and crown, were

somewhat obscured by olive green tips to the feathers, most pronounced on occiput and nape where the ground color is entirely concealed. This differs but slightly from the plumage of winter males but is not apparent in a series of early July specimens, including two taken on same date. Were this the only difference I would not deem it worthy of especial mention, as it may be a common plumage of the non-breeding bird, but there is a decided difference on the under parts. The breast is lemon yellow, contrasting sharply with the black of the throat and blending into yellowish white on the abdomen and gray on sides. The entire plumage is soft, silky and bright, while in normal examples taken at this season it is rough, worn and dull. The sperm ducts were the only evidence of sex I could discover on dissection. It was undoubtedly a non-breeding bird. — J. CLAIRE WOOD, *Detroit, Michigan*.

RECENT LITERATURE.

Stephens's 'Life Areas of California.'—In a paper¹ of eight pages, illustrated with a map, Mr. Stephens summarizes briefly the principal causes controlling the geographical distribution of life, and then proceeds to a detailed, but also brief, consideration of the faunal areas of California, which presents a greater diversity of physical conditions than any other well known region of similar size. With a latitudinal extent of 600 miles, it varies in altitude from below sea level to elevations of nearly 15,000 feet. The north and south trend of the high mountain ranges abstracts the moisture from the air as the winds from the sea pass over them, leaving beyond in the interior areas of great aridity, the annual rainfall in different parts of the State ranging from 80 inches in the northwestern part to 3 or 4 inches in the southeastern part. Under these varied conditions the life zones of the State range from the arctic to the subtropical, the former, however, occupying only limited areas on the higher mountain crests and the latter restricted to the bottom lands of the Colorado River.

Mr. Stephens's major divisions are as currently recognized, the special purpose of the paper being the definition of the minor faunal areas, or 'Faunas,' of which he provisionally defines 17. These are:

1. *Humboldt Fauna*,—a narrow coast belt extending from Oregon south to San Francisco Bay. Transition.
2. *Shasta Fauna*,—the region about Mount Shasta. Transition.
3. *Modoc Fauna*,—the northeastern part of the State, north of Honey Lake, and east of Mount Shasta. Transition.
4. *Sacramento Fauna*,—Sacramento-San Joaquin Valleys. Lower Austral.

¹ Life Areas of California. By Frank Stephens. Trans. San Diego [California] Society of Nat. Hist., Vol. I, No. 1, 1905, pp. 1-8, with map.

5. *Foothill Fauna*,—a belt of the upper Austral along the western lower slope of the Sierra Nevada.

6. *Sierra Nevada Fauna*,—the transition life zone of the Sierra Nevada mountains.

7. *California Alpine Fauna*,—higher parts of the Sierra Nevada. Boreal.

8. *Clear Lake Fauna*,—"a broken region of moderate extent," bounded by the Humboldt, Shasta, and Sacramento Faunas. Upper Austral.

9. *San Luis Obispo Fauna*,—bounded by the Sacramento, Santa Cruz, and San Jacinto Faunas and the Pacific Ocean. Upper Austral.

10. *Santa Cruz Fauna*,—a narrow coast belt, extending from San Francisco Bay south to a little below Point Sur. Transition.

11. *San Jacinto Fauna*,—interior of southern California, south of the San Luis Obispo Fauna and west of the Colorado Desert. Upper Austral.

12. *San Diego Fauna*,—southeastern California. Lower Austral.

13. *San Bernardino Fauna*,—that portion of the Transition zone lying south of latitude 35°.

14. *California Arctic Fauna*,—the summits of the higher peaks of the Sierra Nevada.

15. *Mojave Fauna*,—Mojave Desert. Lower Austral.

16. *Colorado Valley Fauna*,—the Colorado River bottom lands. Subtropical.

17. *Island Fauna*,—the islands off the southern coast of California.

These several faunas, numbered as above in the key to the map, fall into the several life zones as follows :

Arctic.

California Arctic Fauna.

Boreal.

California Alpine Fauna.

Transition.

Modoc Fauna.

Sierra Nevada Fauna.

Mount Shasta Fauna.

Humboldt Fauna.

Santa Cruz Fauna.

San Bernardino Fauna.

Upper Austral.

Foothill Fauna.

Clear Lake Fauna.

Island Fauna.

San Luis Obispo Fauna.

San Jacinto Fauna.

Lower Austral.

Sacramento Fauna.

San Diego Fauna.

Mojave Fauna.

Subtropical.

Colorado Valley Fauna.

While the major life zones of California were defined in a general way some years ago by Dr. Merriam, and also by Mr. Keeler, and some of the minor areas by Dr. Grinnell in 1902,¹ this appears to be the first attempt to delimit and name the Faunas of the State, as such, the faunal areas, or "Isohumic Areas," of Grinnell, ten in number, being climatic rather than faunal. Mr. Stephens's extended field experience in California has made him familiar with the faunal as well as the climatic conditions prevailing over a large part of the State, so that his paper on its faunal areas is based largely on personal knowledge. It is to be regretted, however, that he did not give more space to details in defining his faunal areas, and also that they were not more formally set off typographically in the text.—J. A. A.

Chapman on the Life History of the American Flamingo.²—In this paper of twenty-five pages, with numerous half-tone illustrations from photographs of the living birds, Mr. Chapman has presented the scientific results of his studies of the great Bahama Flamingo rookeries in May, 1902, and May and June, 1904. An earlier popular account of the same observations was given by him in 'The Century Magazine' for December, 1904, and also some notes on the habits of the young birds in 'Bird-Lore' (Vol. VI, pp. 193-198). Also in 'The Auk' for January, 1905 (XXII, pp. 107-109), in our account of the 'Flamingo Group' recently placed on exhibition in the American Museum of Natural History, some reference is made to his successful trip to the Bahamas for Flamingoes in 1904. The present paper gives a systematic and very full account of the life-history of the species as observed under the most favorable conditions. He remained at the rookery from June 7 to June 14, studying the birds at close-range during the height of the breeding season. By erecting skilfully devised 'blinds' he was able to establish himself in the very midst of the great rookery, "without apparently arousing the birds' suspicions," from which the colony could be observed and photographed as a whole, or the individual birds, young and old, "studied from as near as six feet."

After a brief summary of the work of previous observers, he proceeds to give a detailed account of the habits of the birds, including the time of nesting, the character of the nesting ground, the nest and its construction, the eggs, the period of incubation, the habits of the young birds and of the adults, including their notes and food; while the reproduced photographs show the rookery when the birds are in repose (incubating and

¹ Check-List of California Birds. Pacific Coast Avifauna No. 3, June, 1902, pp. 6, 7, and 2 maps.

² A Contribution to the Life History of the American Flamingo (*Phaenicopterus ruber*), with Remarks upon Specimens. By Frank M. Chapman. Bull. Am. Mus. Nat. Hist., XXI, 1905, pp. 53-77, with 15 text figures. June 15, 1905.

sleeping), the nests with the single egg or young bird, the young in various stages of growth, the adults in various acts and attitudes, the old birds in the air leaving the rookery, a deserted rookery, etc. In addition to this the various plumages of the young are described, the adult plumage, the changes in the form of the bill with growth, with a table of comparative measurements of old and young birds, showing the great relative increase in the length of the tarsus in the old as compared with young birds. As a result we have laid before us in detail the life history of a species of which comparatively little was previously positively known. — J. A. A.

Oberholser on Birds Collected in the Kilimanjaro Region, East Africa.¹ — This collection, made by Dr. W. L. Abbott during the years 1898 and 1899, comprises 256 species and subspecies, represented by 684 specimens. Most of the novelties had previously been described by Dr. C. W. Richmond in 1895, the new forms brought out in the present paper numbering three species and six subspecies. In the course of the paper, however, several new genera and ten new subgenera are proposed, since in working up Dr. Abbott's collection Mr. Oberholser has incidentally included considerable revisionary work on several groups of East African birds, and upon the nomenclature of other species.

The collection was found to include a number of rare species, besides extending, even at this late day, the known range of a number of others. "The best idea," says Mr. Oberholser, "of the marvelous richness of this collection of Dr. Abbott's is probably furnished by the subjoined list of 62 species and subspecies that were undescribed when obtained by him, an exposition that is possibly of more than passing interest as indicative of the great progress in African ornithology that the past eighteen years have witnessed." — J. A. A.

McGregor on Philippine Birds. — We are in receipt of two papers² by Mr. McGregor, giving a further account of his ornithological work in the Philippine Islands. The first relates to the islands Romblon, Sibuyan, and Cresta de Gallo, and is based on two months spent in their exploration in 1904 (May 25–July 21). Besides field notes on about 90 species,

¹ Birds collected by Dr. W. L. Abbott in the Kilimanjaro Region, East Africa. By Harry C. Oberholser, Assistant Ornithologist, Department of Agriculture. Proc. U. S. National Museum, Vol. XXVIII, pp. 823–936, 1905.

² I. Birds from the Islands of Romblon, Sibuyan, and Cresta de Gallo. II. Further notes on Birds from Ticao, Cuyo, Culion, Calayan, Lubang, and Luzon. By Richard C. McGregor. Publication No. 25, Bureau of Government Laboratories, Depart. of the Interior, Philippine Islands, Manila, May, 1905. 8vo, pp. 1–34, pll. i, *ibis*, ii–x.

some of which are here recorded for the first time from these islands, two are described as new and descriptions are given of previously unknown plumages of others. Nominal lists follow the general list, giving the species observed on each island.

The second paper is of a similar character, and relates to the islands Ticao, Cuyo, Culion, Calayan, Lubang, and Luzon, and are supplementary to previous papers on collections from these islands. This relates to 15 species, including two described as new and interesting notes on the nesting habits of the Panay Hornbill (*Penelopides panini*) and the nesting habits of several of the Philippine Swifts.

The eleven half-tone plates illustrate the mound of *Megapodius cumingi* (two plates), the nests and eggs of several species of swifts (genus *Salangana*), the nest and eggs of the Panay Hornbill, and a species of *Cisticola*. — J. A. A.

Hartert's 'Die Vögel der paläarktischen Fauna,' Heft III. — The third part¹ of Dr. Hartert's Birds of the Palæarctic Fauna carries the species and subspecies from No. 394 to 629—from about the middle of the Alaudidæ through the families Motacillidæ, Mniotiltidæ (three extralimital species), Nectariniidæ, Zosteropidæ, Certhiidæ, Sittidæ, and the greater part of Paridæ. The method of treatment is of course uniform with that of the preceding parts (*cf.* Auk, XXI, 1904, pp. 95 and 505), showing similar conservatism in respect to genera and the same proneness to fine splitting in respect to subspecies. Especially noticeable also is the tendency to combine allied forms as subspecies, sometimes apparently without satisfactory reasons therefor, as where *Parus sclateri* of Mexico is made a subspecies of *Parus palustris*, although separated geographically by thousands of miles from the range of any other member of the group. Similarly a form of Nuthatch from Corsica and another from northern China are made subspecies of *Sitta canadensis*. Ten palæarctic forms of titmice are referred to *Parus atricapillus*, including the whole *P. montanus* group, and a number of others. The author apparently has no use for subgenera, all of the palæarctic subgenera of *Parus*, recognized by Hellmayr in his recent excellent monograph of the Paridæ, being merged in *Parus*. In short, our author's treatment of this and allied families is far less satisfactory, and less consistent and rational, than the recent revision of these groups by Hellmayr. Hartert includes under *Parus* 93 palæarctic forms, of which 20 rank as species and of which 8 have no subspecies, leaving 73 subspecies under the other 12 species, or an average

¹ Die Vögel | der paläarktischen Fauna. | Systematische Übersicht | der | in Europa, Nord Asien und der Mettelmeerregion | vorkommenden Vögel. | Von | Dr. Ernst Hartert. | Heft III. | Seite 241-384. | Mit 16 Abbildungen. | — | Berlin. | Verlag von R. Friedländer und Sohn. | Ausgegeben im Juni 1905.— 8vo, pp. 241-384. Price 4 marks.

of 6 (= 7 forms) to each, *P. major* and *P. palustris* each having 13, *P. ater* 14, etc.

The Alaskan *Budytes flavus alascensis* Ridgw. stands as *Motacilla flava alascensis*; the North American *Anthus pensylvanicus* as *A. spinoletta pensylvanica*.

Eremophila is used in place of *Otocoris*, since in the opinion of Mr. Hartert the generic names *Eremophilus* and *Eremophila* are both tenable. It may here be also noted that from his point of view a specific or subspecific name need not agree in gender with the generic name, it being his preference to preserve the original ending of a specific name when transferred to a genus which has a different gender ending, as in the case above of *Anthus pensylvanicus*, which was originally described as a species of *Alauda*. It may be further noted that the palæarctic species of *Otocoris* here recognized number 15, all subspecies of *alpestris*, as against 14 recently admitted by Oberholser, who, however, gave full specific rank to 5 of them. But in only nine cases are the same names adopted.

Despite certain excentricities of treatment, Dr. Hartert's 'Die Vögel der paläarktischen Fauna' will long prove a most useful and convenient hand-book, for which ornithologists may well feel deeply grateful.—
J. A. A.

Clark on the Amount of Difference that should characterize Species and Subspecies.—We regret that the character of Mr. Clark's paper¹ is such that if it is to be noticed here at all it must be considered at some length. Were it not that it doubtless reflects the attitude of the 'lay' class, and thus appeals to the sympathies of the untrained who have neither the opportunity nor, perhaps, the desire to become experts, and is thus a misleading presentation of the case, it might well be passed over without mention. The author, Dr. Hubert Lyman Clark, is not unknown to readers of 'The Auk' and to ornithologists in general through his various excellent papers on the pterylography of various groups of birds, but so far as technical descriptive ornithology goes his experience has evidently been extremely limited. That such is the case, the rules he prescribes give evidence.

In the present paper he has formulated "fundamental rules," which, it seems to him, ought to govern work in systematic zoölogy. They are each explained and defended at some length against criticisms made by the present reviewer upon a previous paper of his on the same subject. The history of the case cannot be given better than in his own words. As the following quotations contain transcripts of the previous objectionable criticisms they will in part cover what it seems desirable to say in the present connection. He says:

¹ The Limits of Difference in Specific and Subspecific Distinctions. By Hubert Lyman Clark. Fifth Annual Report of the Michigan Academy of Science for the year 1903, pp. 216–218.

"It was my misfortune last summer to feel called upon to criticise some recent ornithological work in which the process of recognizing subspecies had been carried to the extreme, and my opinions were published in *SCIENCE*, August 8, 1902, under the heading 'So-called Species and Subspecies.' In the same journal, September 5, Dr. J. A. Allen, the well known zoologist, criticised my opinions as those of a layman, and emphatically denied two of my main contentions. As nothing is gained by newspaper controversy, I made no reply, but the questions involved are extremely important and after six months further consideration of them, I have decided to set forth what seem to me some of the fundamental rules, which ought to govern work in systematic zoology. First, however, as Dr. Allen has challenged my right to opinions on the subject, it is only fair to say that, although I have never described a new or supposedly new bird, I have had occasion to examine carefully several thousand specimens of echinoderms, and have been under the necessity of naming a number of new species in that group, so that I am not an entire stranger to the numerous perplexities of the systematist, to which Dr. Allen refers. Now I freely admit that from the systematist's point of view, birds are more perplexing than echinoderms, and that Dr. Allen, both because of his naturally judicious temperament and by his many years of experience amid exceptional opportunities, is far better qualified to discuss this subject than am I. Yet I do feel, that whether the animal be a bird, a fish, a worm or an infusorian, the essential principles of systematic zoology ought to be the same in all cases, and that any zoologist who has wrestled honestly with the knotty problem of specific distinctions is entitled to opinions on the subject. I therefore venture to state some of these essential principles as they appear to me.

"1. Characters which are not sufficiently conspicuous, so that they can be stated in language or figures of some sort, ought not to be made the basis of a new name.

"This principle appears so axiomatic that an apology would be made for stating it here, if it had not been seriously questioned by Dr. Allen. He says: 'In ornithology, and especially in mammalogy, perfectly "good species" are often so similar in size and color that even the expert cannot satisfactorily identify them from descriptions, and hence, almost from time immemorial, direct comparison with authentic material has been necessary in order to settle such difficult cases. As all experts in this line of study well know, forms that may be indistinguishable by descriptions are, when brought together, and especially when series are compared, so noticeably different that there is no trouble in distinguishing them at a glance.' Now I confess that after giving these words careful thought I am unable to believe that the validity of my contention is affected. I am utterly unable to conceive of two objects, which I could 'distinguish at a glance,' the differences between which would be so intangible that I could not state them 'in language or figures of some sort.' As to the comparison of specimens with types or other authentic

specimens, 'from time immemorial,' surely it is well known that the necessity for this is due to imperfect, inaccurate and erroneous descriptions, and not to the fact that 'perfectly "good" species' cannot be distinguished without comparison. If a character, whether in color, size, form, texture, odor, notes, habit or anything else, cannot be detected by sight, touch, smell, taste or hearing to such a degree as to admit its translation into intelligible language or figures, it surely is not fit to be made the basis of a new name. Of course I do not contend that the 'language or figures' must be intelligible to the 'layman,' for that unfortunately is not at present feasible and probably never will be."

In regard to "imperfect, inaccurate and erroneous descriptions," it may be said that such we have always with us, and always will have; they almost form the bulk of past descriptive zoölogy, and will hold also a prominent place in the future; they are partly, perhaps largely, due to carelessness and slovenly methods, but are in part inherent and unavoidable, until a standard terminology for shades of difference in colors shall have been invented and generally adopted. Language at present is inadequate to convey to the mind definite and exact shades of color, even when strikingly different to the eye, because scarcely any two persons would describe the same shades between, say buff and chestnut, running through the endless tones of yellowish and reddish browns, in just the same terms. Whatever the cause of this vagueness of description, it exists, and will exist for a long time to come, producing a condition militant against Mr. Clark's 'Principle 1.' Words, as we now have to use them, cannot adequately convey to the mind differences in color and texture that are palpable enough when seen.

"2. Differences in dimensions, of less than five per cent., ought not to be made the basis of a new name.

"This principle is certainly not radical, yet it would shut out a large number of recently described subspecies of birds, and perhaps other animals also. The reason for this rule is that individual variation in a species is so much larger than was formerly supposed, no constant difference can be maintained between two forms which differ from each other by less than five per cent. in size. I believe ten per cent. would be a safe rule, but if five per cent. could be agreed on many ridiculous new names would never see the light of day. In Dr. Allen's famous paper 'On the Mammals and Winter Birds of East Florida' (Cambridge, 1871), he says: 'The facts of the case show that a variation of from fifteen to twenty per cent. in general size, and an equal degree of variation in the relative size of different parts, may be ordinarily expected among specimens of the same species and sex taken at the same locality, while in some cases the variation is even greater than this.' Such being the case five per cent. is not a high standard to suggest."

While Mr. Clark's quotation from my 'Mammals and Winter Birds of East Florida' respecting individual variation is all true, there is another side to the question, and that is that the average difference in general size

or the size of particular parts, as the bill, wing, tail, tarsus, etc., in closely related species is often much less than the range of purely individual variation in any one of the several species that may be involved; and where color at the same time may fail, as happens in some groups, even the expert is sorely puzzled to discriminate between museum specimens of species that in life are at once recognizable as distinct by their notes, habits, pose, and almost every act and attitude, as in the case of some of the species of the genus *Empidonax*. Thus an expert confessed to me that on one occasion when he came to label up his season's collecting he found that in order to tell 'tother from which' in the case of two perfectly distinct species of *Empidonax* he had to resort to dates of collecting and his notes on the living birds entered in his notebook to decide which was which! The present writer once had also a similar experience. Yet it is not quite impossible nearly always to recognize these closely related forms—good species, not subspecies—without recourse to notes on the living bird. Much more might be said anent "Principle 2"; but inasmuch as many species that no one could confound in life would be ruled out by the "five per cent." rule, it is hardly necessary to say more.

"3. *Characters which cannot be recognized without knowledge of the geographical origin of the specimen ought not to be made the basis of a new name.*

"This is a very essential principle if we agree that an important end of systematic zoology is correct knowledge of the geographical distribution of animals. It seems to me axiomatic that characters which cannot be recognized regardless of the locality where the specimens are collected are worthless, yet Dr. Allen holds to the contrary, and regards my support of this principle as evidence of my writing without possessing the necessary familiarity with the facts. The horned lark from Mexico named *Otocoris alpestris chrysolæma* by Oberholser differs from the same author's subspecies *actia* so slightly that he himself admits they are indistinguishable, unless the locality where collected is known. I am unable to see what possible gain there is in giving a name to such a form; while christening it may easily lead to serious errors in determining the geographical distribution of the real subspecies of horned larks. And in all other groups of animals, the confusion of special geographical position with essential morphological character leads, and always will lead, to most erroneous conclusions concerning the distribution and history of species. A well known American mammalogist is said to hold the view that any mammal resident on an island must necessarily be a different subspecies from the form on the neighboring mainland, because of its isolation. If such views are current among systematists, (which I greatly doubt), it is not strange that morphologists, physiologists and embryologists have long held systematic zoology in contempt, and even now regard with suspicion our claims to a place among the real devotees of science."

Respecting 'Principle 3' little need be said, either in its favor or

against it. It may stand as at least a suggestion worthy of serious consideration. We confess being to a large degree in sympathy with it and with much of the author's comment thereon. It is to be noted, however, that in the case of closely related subspecies, the normal range of individual variation might make it impossible to properly refer occasional specimens without a knowledge of the locality of their origin; and probably more than once has the mistake been made of recording a western race from an eastern locality on the basis of an aberrant eastern bird.

In regard to slightly differentiated insular forms, it was at one time quite generally held that as there could not be actual intergradation between such forms and the mainland stock (in the case particularly of the smaller land mammals), owing to their physical isolation, it was better to recognize such forms as species than as subspecies, since the latter are either known or assumed to intergrade through the continuous range of the geographical forms of a widely dispersed species. Of late, however, this method is being largely abandoned, slightly differentiated insular forms being now very generally treated as subspecies.

Now that Mr. Clark has voiced the 'contempt' long held by morphologists, physiologists and embryologists respecting the work of systematic zoologists, the retort may be made that the contempt is, to a certain extent, mutual, and perhaps to some degree not without cause on both sides. But only the most narrow-minded of either class can fail to recognize good work outside of their own circumscribed specialities. A certain class of the 'section-cutters' take little account of the broader relations of animals to their surroundings, and in their histological and statistical investigations have been known time and again to work on a lot of heterogeneous material under the impression that it was all comparable and homogeneous,—as conspecific while in some instances it was not even congeneric, to say nothing of generalizations under statistical methods based on incongruous and non-comparable material.

"4. Characters which will not distinguish corresponding ages or sexes of two forms ought not to be made the basis of a new name.

"This seems so self-evident, I hesitate to state it, but as it may prove the one on which we can all agree I mention it, although it is no more obvious to me than principles one and three. Of course this does not mean that the characters must be present in both sexes at all ages. On the contrary, the characters may be present only in one sex or at a particular time of life, but they must distinguish from the corresponding sex or age."

The author's comment under 'Principle 4' to some extent explains its intent, without which it would be quite absurd. Thus: "Characters which will not distinguish corresponding ages or sexes of two forms," etc.; but he evidently does not mean this to apply to species in which, while the adult males are too distinct to be confounded by the merest tyro, the females and young cannot be positively discriminated by the expert; or in other cases where, while the females are distinguish-

able, the adult males are indistinguishable. As it stands, even with the explanation, it has little relevancy or *raison d'être*.

"5. *Characters which are notoriously variable in a given group ought not, within that group, to be made the basis of a new name.*

"As an example of what is meant by this principle, the common starfishes (*Asterias forbesi* and *vulgaris*) of the New England coast may be cited. Their color is so remarkably variable that it would be folly to form subspecies based upon the color alone.

"6. *Characters which may be fairly interpreted either as individual peculiarities or as dichromatic diversity, ought not to be made the basis of a new name.*

"If this principle were honestly followed many new species and subspecies would be cancelled, and it would lead to much greater caution in basing new names upon single individuals.

"The above six principles are suggested, not with any idea that they will meet with universal approval, but in the hope that they may precipitate a discussion which will lead to definite results. At some not far-distant day let us trust, the charge of basing new names upon 'distinctions without a difference' will be one that cannot be brought legitimately against American zoologists."

Respecting "5" and "6," little need be said; they are certainly harmless, if not very helpful, for no experienced 'systematist' is likely to violate either.

The concluding paragraph of Mr. Clark's paper is given as clearly showing his good intentions. This republication of his paper in full, and the running comment thereon, may be taken as an attempt to comply with his desire that it "may precipitate discussion which will lead to definite results."—J. A. A.

Mascha's 'The Structure of Wing-Feathers.—This is an account¹ of an investigation by Dr. E. Mascha, under the direction of Professor R. von Lendenfeld of the Imperial German University in Prague, with the object of giving "a detailed account of the morphology of the wing-feathers of birds as used in flight," made with the hope of supplying "needed and valuable information for those interested in the great problem of aërial navigation." It is based on the examination of the quills of about 25 species, belonging to about a dozen orders, and comprising birds of most types of flight. Their histological structure is described in detail, and illustrated by figures grouped to form 16 plates. The text has apparently suffered in translation from the original German manuscript (to be published in the 'Zeitschrift für wissenschaftliche Zoologie,' here and there occurring terms and sentences by no means clearly expressed. At the end of the paper a 'summary of results' is given, in sixteen short para-

¹ The Structure of Wing-Feathers. By Dr. E. Mascha. Smithsonian Misc. Coll., Quarterly Issue, Vol. III, pp. 1-30, pll. i-xvi. May 6, 1905.

graphs. Similarity of structure in several important features is found to be common to the Owls and Caprimulgi which are not met with in any other groups. Whether or not the author's investigation will aid those interested in aërial navigation, it forms an important contribution to our knowledge of the structure of the flight feathers in birds.—J. A. A.

Jacobs's West Virginia Bird Notes.—Number IV of Mr. Jacobs's 'Gleanings'¹ consists of a briefly annotated list of the summer birds of Monongalia County, West Virginia. As the list, numbering 51 species, is based on observations made June 1, 1895, it is a good record for a single day's work. The list is followed by a few supplementary notes made on June 19 of the same year, and on August 21–23, 1897, which include a number of species not given in the formal list.—J. A. A.

Howe's 'Fifty Common Birds of Vermont.'—This brochure of 92 pages² "has been written for the purpose of creating among teachers and school children of our State a greater and a deeper love for Vermont birds." It is evidently well adapted to this end. Brief descriptions are given of fifty of the more common species met with in Vermont, with such further comment as should render them easily recognizable, aided by a text figure of each species, usually from photographs of mounted birds. Unfortunately some of them were taken from rather unsightly specimens. An appropriate introduction precedes the general text, which is followed by lists of birds noted by different observers at several localities, the species being given under their common English names. A line to each is sufficient, by use of abbreviations, to indicate the season, relative abundance, and date of earliest arrival. These lists are: Birds of Brattleboro and vicinity, by Mrs. Elizabeth B. Davenport; birds about St. Johnsbury, compiled by Miss Isabel M. Paddock; birds of Bennington and vicinity, by Dr. and Mrs. L. H. Ross; birds of Rutland County, by G. H. Ross; migration list of birds for Bristol County and vicinity, by A. C. Dike; also a nominal list of the birds of Vermont, based on

¹ Gleanings IV. | Some notes | on the Summer Birds | of | Monongalia County, | West Virginia. | — | Observations made near | Blacksville and Morgantown and along | the Monongahela River | — | By | J. Warren Jacobs, Waynesburg, Pa. | — | 1905 | Independent Printing Co.—8vo, pp. 11 and frontispiece. 15 cents.

² Fifty Common Birds of Vermont. By Carlton Dexter Howe, Principal of the Essex Junction High School, President of the Aududon Society of Vermont.= Circulars of Educational Information, No. XVIII. Prepared for Teachers and School Officers. Issued by the Department of Education, State of Vermont. Montpelier, 1905. 8vo, pp. 92, with 50 text figures.

the list of Perkins and Howe, published in 1901. A few pages of further useful and pertinent information conclude this useful little manual.—J. A. A.

Oberholser on the Nomenclature of Certain Genera of Birds.¹—Seventeen generic names and a few specific names are here held to require change, the specific names belonging to genera here treated. The first name considered is *Bellona* Mulsant & Verreaux (1866), which, as Mr. Riley (Auk, 1904, p. 75) recently pointed out, is preoccupied by *Bellona* Reichenbach, 1852. Instead, however, of requiring a new name, as claimed by Riley, it may be replaced by *Orthorhynchus* Lacépède, 1799, for which the type was fixed by Gray in 1840 as *Trochilus cristatus* Linn. We agree with Mr. Oberholser that *Orthorhynchus* is the proper name for this genus of West Indian hummingbirds, for which it was formerly for many years² in current use. Consequently Riley's substitution of *Orthorhynchus* for *Chrysolampis*, and of *Chrysolampis* for *Eulampis* are uncalled for and the hitherto current names of these genera remain unchanged. Mr. Riley's effort is cited by Mr. Oberholser as a "forcible illustration of the difficulty and unsatisfactory nature of generic type determinations by elimination." As we have said elsewhere (Science, N. S., XXI, p. 431, March 17, 1905): "The results will vary somewhat with the experience and qualifications of the user of the method, if the conditions of the question are especially complicated and perplexing . . .", while "experts in such cases rarely reach different conclusions . . ."

"*Dromæus* Vieillot" is shown to be properly *Dromiceius*, the form first used by Vieillot, who did not use *Dromæus*; *Hydrornis* Milne-Edwards, being preoccupied, is replaced by *Dyspetornis*, nom. nov.; *Nænia* Boie, being preoccupied, a substitute is found in *Inca* Jardine; *Gnathosittaca* Cabanis, being preoccupied, is replaced by *Ognorhynchus* Gray; an earlier name for *Dasyptilus* Wagler is found in *Psittichas* Lesson; *Nanodes* Vig. & Horsf., being preoccupied, a substitute is found in *Euphema* Wagler; *Sharpia* Bocage being preoccupied, and there being no available substitute, it is replaced by *Notiospiza*, nom. nov.; similarly, *Malacopteron* Eyton is replaced by *Horizillas*, nom. nov.; *Hedymela* Sundevall is antedated by *Ficedula* Brisson; *Chenorhamphus* Oustalet, being preoccupied, is replaced by *Conopotheras*, nom. nov.; *Charitospiza* is a new name for the South American genus formerly known as *Tiaris*, containing the *Fringilla ornata* Wied; this specific name being preoccupied is changed to *eucosma*, nom. nov.

The status of four other names — *Xiphorhynchus*, *Vermivora*, *Cotur-*

¹ Notes on the Nomenclature of Certain Genera of Birds. By Harry C. Oberholser. Smithsonian Misc. Coll., Quarterly Issue, Vol. III, pp. 59-68. May 13, 1905

niculus, and *Ammodromus* — three of them proposed by Swainson in 1827, is less easily decided, although Mr. Oberholser considers that they "must apparently be changed." He accordingly proceeds to transfer the currently recognized species of *Dendroornis* Eyton to *Xiphorhynchus*, and to replace the superceded *Dendroornis* by the new name *Xiphornis*; *Vermivora* is made to replace *Helminthophila*; *Coturniculus* is replaced by *Ammodramus*, and a new name, *Ammospiza*, is provided for the group currently known as *Ammodromus*. As stated elsewhere (*antea*, pp. 400–407), we consider these changes unfortunate and undesirable, because unnecessary.—J. A. A.

Forbush on the Decrease of Birds and Means for their Protection. — In a 'Special Report' of more than a hundred pages, made under the direction of the Massachusetts State Board of Agriculture,¹ Mr. Forbush has compiled a mass of information on this subject of the utmost interest and importance. It is based largely upon replies to circulars sent out in July, 1903, to naturalists and other intelligent observers, soliciting information regarding the decrease of birds in Massachusetts. Information of more or less value was thus obtained from 217 correspondents. An analysis of these reports, as presented by Mr. Forbush, indicates a great decrease in the number of game birds, especially water-fowl and shore birds, and also in most of the birds of prey, while most of the insectivorous and song birds have well held their own, with local fluctuations in numbers, for the most part readily explained.

The subject matter of the Report is well arranged, and the evidence is presented with fairness, unbiased by sentiment or any evident desire to make out a case. In reference to the destruction of birds by the elements, with special reference to the unusual weather of 1903–04 — the June rainstorms of 1903 and the severe winter following — it is gratifying to find that while many species suffered severely, only the Purple Martin appears to have met with a "lasting or permanent check." Regarding the general subject, the "expert evidence," or the testimony of competent observers, is summarized by counties, and the conclusion therefrom is "that with the smaller species the natural balance of bird-life is now fairly constant in Massachusetts and the neighboring States." The birds reported as diminishing in numbers are then taken up by families, beginning with the Grebes, and the evidence presented, contrasting present with former conditions. Among the water birds, as the gulls, terns, ducks and geese, some species have suffered great decrease, although many of the ducks

¹ Special Report on the Decrease of certain Birds, and its Causes, with Suggestions for Bird Protection. By Edward Howe Forbush. Prepared under the direction of the Massachusetts State Board of Agriculture. Fifty-second Ann. Rep. Massachusetts State Board of Agric., pp. 429–543. with 2 pll. 1905.

appear to have well maintained themselves; which, however, is not the case with the shore birds (*Limicolæ*), which have nearly all decreased greatly in number. Those now considered common were formerly abundant, as were some that are now rare or casual, some of the larger species having become nearly exterminated or driven off the coast.

In regard to the cause of this decrease, it is "evident that man and his works are of the most importance." The first rank is given to sportsmen, or 'so-called sportsmen,' the second to "Italians and other foreigners"; market hunters rank third, and bird shooters and trappers fourth; while the clearing and draining of land, and other modern improvements, directly or indirectly contribute a smaller and for the most part non-preventable share. Detailed statements of facts well indicate the rôle respectively enacted by these agencies.

Considerable space is given to a consideration of the natural enemies of birds, as cats and dogs, foxes, skunks, weasels, crows, jays, and the English Sparrow — last but not least, although "it is well that the fox and crow are not protected by law," in proof of which Mr. Forbush gives abundant evidence.

Finally suggestions are made for the better protection of birds, which include educational work, the improvement and better enforcement of the laws, and "*control of the cat*," which is admitted by all careful observers to be one of the worst enemies of wild birds.

Mr. Forbush's 'Special Report,' taken all in all, is one of the most judicial, instructive, and important publications in the interest of bird protection that has yet appeared, and should have the widest possible circulation.—J. A. A.

Palmer on Game Protection.—In a recent paper of twelve pages Dr. T. S. Palmer recounts 'Some Benefits the Farmer may derive from Game Protection.'¹ These are security against trespass on the part of hunters; a check on hunting, through the requirement in a number of States of a hunting license, thus checking the number of would-be hunters roaming at will over a State; giving the land owner the right to eject trespassers and to collect damages for injury to his property; the protection of useful birds, as the insectivorous and seed-eating species; protection against the introduction of injurious species of mammals and birds; financial benefits, arising from the sale of live game for propagating purposes, and the lease of hunting privileges, etc. Each of these is explained and its advantages commented on at length.

Another paper by Dr. Palmer relating to the protection of game and birds is a 'Directory of State Officials and Organizations concerned with the Protection of Birds and Game.'² This gives a list of the State

¹ Yearbook of U. S. Department of Agriculture for 1904, pp. 509-520.

² 'Circular No. 50' of the Bureau of Biological Survey, United States Department of Agriculture. 8vo, pp. 16. Revised to Aug. 15, 1905.

officials of all the States and Territories of the United States and the Provinces of Canada, their titles, names, and addresses, and the titles of their official publications. Also a list of all the National and State organizations interested in game and bird protection, with the names and addresses of the president and secretary of each; and there is a similar list of all the Audubon Societies.

Still another useful publication is "Poster No. 10, August, 1905," prepared by Dr. Palmer and Messrs. Henry Oldys and R. W. Williams, Jr., and issued by the United States Department of Agriculture (Biological Survey), giving the 'Close Seasons for Game in the United States and Canada, 1905.'

These publications indicate the activity and up-to-date character of the work of the Game Preservation Division of the Biological Survey, in charge of Dr. Palmer, and give information of the greatest importance and convenience to those interested either in the preservation or pursuit of game, or the protection of birds. — J. A. A.

NOTES AND NEWS.

WALTER E. BRYANT, a Corresponding Member of the American Ornithologists' Union, died in San Francisco, California, May 21, 1905. His place in the history of West Coast ornithology is important by reason of his substantial and accurate contributions to the literature of the subject and the influence of his personality upon other workers. As Mr. Joseph Grinnell has said in another place: "The life histories of many of our remotely restricted species would remain to-day almost wholly unknown if Bryant had not spent lonely months in their study and then composed what he learned in the form in which we find it now so instructive." His explorations brought to light a number of new birds and mammals, some of which bear his name.

Bryant's first article on natural history appeared in 'Science News' Vol. I, No. 7, 1878, but "the majority of his published writings appeared from 1887 to 1889 in the 'Bulletin' and 'Proceedings' of the California Academy of Sciences, and from 1890 to 1893 in 'Zoe,' a periodical published for four years at San Francisco. These seven years marked the period of Bryant's greatest activity in natural history lines, and the articles resulting from his work evince an evident endeavor to express plainly and accurately whatever he thought worthy of record. Not that his descriptions and recitals are tiresomely commonplace, for I have seldom read anything more fascinating to a naturalist than the accounts of his experiences while collecting in Lower California, and on Guadelupe

Island. And as for the scientific value of Bryant's recorded observations, where can we find any more reliable and valuable contributions to West Coast ornithology.¹ Between 1880 and 1894 Bryant published forty articles and notes on ornithological subjects. Of these the more important are: 'Nest and Eggs of *Myiadestes townsendi*' (Auk, I, 91); '*Piranga rubriceps* and *Tringa fuscicollis* in California' (Ibid. IV, 78); 'Additions to the Ornithology of Guadelupe Island' (Bull. Cal. Ac. Sci. II, 269); 'Discovery of the Nest and Eggs of the Evening Grosbeak (*Coccothraustes vespertina*)' (Ibid. II, 449); 'Description of a New Subspecies of Petrel from Guadelupe Island' (Ibid. II, 450); 'Birds and Eggs from the Farallon Islands' (Proc. Cal. Acad. Sc. 2d ser. I, 25); 'Description of a New Subspecies of Song Sparrow from Lower California, Mexico' (Ibid. I, 197); 'Descriptions of the Nests and Eggs of some Lower Californian Birds, with a Description of the Young Plumage of *Geothlypis beldingi*' (Ibid. II, 20); '*Puffinus griseus* (Gmel.), *Puffinus gavia* (Forst.), and *Stercorarius pomarinus* (Temm.) on the Coast of California' (Ibid. II, 87); 'A Catalogue of the Birds of Lower California, Mexico' (Ibid. II, 237); 'Notices of Supposed New Birds' (Zoe, I, 148); 'The Cape Region of Baja California' (Ibid. II, 185); 'A Check-list of the Water Birds of California' (Ibid. III, 135); 'Occurrence of *Clangula hyemalis* in California' (Ibid. III, 363).² Among these papers were several based upon the work of others and illustrate a characteristic of the author. He was in correspondence with many of the younger ornithologists of the West and was continually encouraging them and suggesting lines of work or observation to them. If results of importance were thus secured, he often elaborated them for publication, always giving fullest credit to the observers. In this way he brought out many interesting points which otherwise might never have seen light. He also wrote upon the mammals of the regions which he visited, having described several very distinct forms.

Walter E. Bryant was born January 14, 1861, at Sonoma, Sonoma County, California, and was the son of Daniel Sharp and Susan H. Bryant. His parents moved to Oakland when he was four years old and he resided there (with few exceptions) until 1896 when he moved to Santa Rosa. His education was secured in a private and, subsequently, in the public schools of Oakland. As a child he was passionately fond of natural history, especially of flowers. He was trained from childhood by his father in the use of firearms, his first gun having been given him when he was seven years old. When still quite young he commenced collecting insects and eggs, and he also mounted birds, having been instructed by his father. His father, who was at one time a very prosperous merchant of San Francisco, had been interested in birds as an amateur and had formed a considerable collection, chiefly of mounted

¹ Joseph Grinnell in 'The Condor,' Sept. 1905.

² The writer is indebted to Mr. Joseph Grinnell for this list.

specimens, which was doubtless the inspiration of the son. In 1884 Bryant received instruction from William T. Hornaday in mounting mammals, and he studied museum work at the National Museum, and the Museum of Comparative Zoölogy in Cambridge.

The greater part of his time was given to ornithology and other natural history work. From 1886 to 1894 he was curator in the California Academy of Sciences. His principal expeditions during which he made natural history collections were as follows: 1883, summer in Oregon; 1884, Guadelupe Island in December; 1885-'86, Guadelupe Island for four or five months in winter; 1887-'88, California and Nevada; 1889, vicinity of Magdalena Bay and adjacent islands, Lower California; 1890, Gulf region, Lower California; 1892, in the spring, San José del Cabo, and vicinity, L. C.; 1901, Central America; 1902-'03, two summers in Alaska; June, 1904-April, 1905, San Blas, Mexico.

Bryant's ornithological work, for which he had an unusual enthusiasm, was undoubtedly much curtailed by a series of misfortunes, financial and otherwise, which befell him just at the time when he should have been doing his best work. But for these unfortunate circumstances he might have been greatly more active. He was especially interested in humming-birds, of which he had a large collection. This, with his collection of nests and eggs, is now the property of his mother. He gave his mounted birds to his father previous to his last trip, and his mammals were sent last year to the Milwaukee Museum. His other bird skins were disposed of a number of years ago to the California Academy of Sciences, in coöperation with which institution some of his more important expeditions were undertaken.

A little over a year ago Bryant went to San Blas, Mexico, to investigate and straighten out the tangled affairs of a fruit company. With his usual conscientious care he thoroughly succeeded, but overworked, and in that abominable climate brought on a serious illness which later caused his death. Bryant was the moving spirit and only president of the short lived California Ornithological Club which was organized in San Francisco in 1889. Although the sudden removal of several of its active members made this club a failure it served a purpose as the forerunner of the Cooper Ornithological Club which appeared a few years later. Bryant was at one time an Active Member of the A. O. U. and later was made a Corresponding Fellow. In recognition of his services to California ornithology he was elected to honorary membership in the Cooper Ornithological Club, of which organization he was once the president.

Two well known western birds bear his name, *Ammodramus sandwichensis bryanti* Ridgway, and *Heleodytes brunneicapillus bryanti* Anthony. Two species of mammals have also been named for him, a woodrat, *Neotoma bryanti* Merriam, and a pocket mouse, *Perognathus bryanti* Merriam.
— W. K. FISHER.

DENIS GALE, a well known ornithologist, died at his home in Denver, Colorado, Feb. 26, 1905. Mr. Gale was born in London Aug. 10, 1828. When he was a boy of but five years his parents came to America and settled in Quebec, Canada. While in Quebec he attended school at a boys' seminary until he was fifteen years of age, when he quit school to work in the lumber business.

His duties in this business necessitated his traveling many miles to visit logging camps in the environs of Quebec, these journeys being often made on snow shoes and in sleds. It was while he was thus engaged that his propensity and love for natural history received their quickening impulse from his natural surroundings. Laborious journeys were made light by his keen interest in every bird that flitted across his path, and with his note-book ever ready to receive its daily contributions he there began active work in the ornithological studies that he pursued with few interruptions through life. He was possessed of keen vision and hearing, was quiet and reserved in disposition, and even as a boy of thirteen or fourteen he shunned the plays of his schoolboy friends and sought solitude in fields and woods.

He remained in Quebec till he had reached the age of forty when he moved to Albany, N. Y., where he became engaged as an artist and art dealer, giving lessons in painting and drawing. Three years later he moved to Philadelphia, Pa., and there followed the same occupation.

He was a recognized critic in the fine arts and was honored with numerous responsible appointments. In 1878 he was given charge of the United States art exhibit in Paris, and in 1880 was honored with a similar appointment at the exhibition in California.

In 1881 he became interested in mining at Gold Hill, Boulder Co., Col. During the first eleven years of his mining venture he continued to make his home in Philadelphia, coming to Colorado each year in April and remaining through November. Although he had been forced on account of his business and urban surroundings to practically discontinue his nature work while in Albany and Philadelphia, when he first came to Colorado he became so impressed with this new field and the excellent opportunities before him that his natural inclinations were again given rein and he became one of the pioneer naturalists of our State.

In 1892 he moved with his family from Philadelphia to Denver, where he continued to live up to his death, making his summer home at Gold Hill.

His natural history work was chiefly along oölogical lines, although he did some work in collecting and preparing bird skins. With mammals he did but little but in this work he has the discovery of one new mouse to his credit. Of all the new material that he collected he generously sent the first and best to the National Museum at Washington, which has been the recipient from him of several hundred bird skins and sets of eggs. He took the first set of Clark's Crow's eggs ever taken in Colorado,

which set is now in the National Museum. He was a personal friend of Captain Bendire, and in his book 'Life Histories of Birds of North America,' as well as in other bird publications, his name may be found mentioned along with an interesting note on birds. Being of a retiring disposition he avoided publicity, and it is to be regretted that he seldom, if ever, wrote of his interesting observations and discoveries.

In 1892 he was accidentally shot in the knee, which accident made it difficult for him to get about on foot to study the habits of birds. Thus again his nature work was interrupted never again to be resumed. The collection of birds' eggs which he was at that time making, and which he retained until his death, is now in the possession of the University of Colorado. [See also *antea*, p. 422.]

In the history of our State the name of Denis Gale will be recorded as a faithful, enthusiastic pioneer bird student, and the memory of his life and work among us will ever serve as an impetus to us younger bird students to take up the work where he left it and do our little part in carrying it to completion. — A. H. F.

DEATH OF GUY M. BRADLEY.—The cause of bird protection has had a serious set-back in the murder of Guy M. Bradley, who was employed by the National Association of Audubon Societies as Warden in Monroe County, Florida. He was also the County Game Warden by appointment of the Governor. The district in which he acted was a very large and extremely wild one, extending from Chokoloskee Bay on the north, through the southwestern part of the Everglades, the Thousand Island district, Cape Sable, and all of the chain of Keys west of Long Key, including the city of Key West.

His territory demanded a man of iron nerve and unfaltering courage in order to face the dangers that always surrounded him. Outlaws, both white and black, lived in the recesses of the swamps, and plume hunters, who were hardly of a better class, were always on the watch for an opportunity to carry on their trade if they could escape the vigilance of the Warden. Bradley possessed a cast-iron constitution and untiring energy, and no hardship of heat or storm or fatigue seemed able to keep him from performing his duty. He was one of the quickest and best shots in southern Florida, and his murderer must have shot him unawares. The history of the case as sent to the Association by Attorney Lewis A. Harris indicates that the murder was premeditated and cold-blooded. Walter Smith anchored his schooner opposite the home of Bradley and then sent his two sons to a Key where they shot some protected birds. This was probably done to lure the Warden on. He went out in a small boat in order to arrest the eldest of the lads who had been recalled to the schooner by a signal. Bradley on reaching the side of the larger boat told the boy he was under arrest and that he must get into his, Bradley's, boat. This, by order of his father, he did not do; Walter Smith then told Bradley that if he attempted to take the boy that he would shoot. Smith

claims that Bradley then fired one shot at him from a revolver but missed; thereupon he shot with a Winchester rifle at Bradley. He claims that his victim fell on the bottom of the boat but immediately struggled to his knees and attempted to fire his revolver again but was unable to do so. Bradley's body was permitted to float away in his boat and was not found until twenty-four hours after. The statement of Smith that his victim tried to shoot a second time seems very improbable. The ball struck Bradley on the upper part of the right breast, ranged downward through the vitals and pulverized about four inches of his backbone below the last rib. Death must have been instantaneous.

The National Association has engaged the best criminal lawyer in Key West, who was a devoted friend of Bradley, to assist the public prosecutor in conducting the case. The murderer is confined in jail at Key West, being unable to secure \$5,000 bail, awaiting the action of the Grand Jury, which meets in November next.

Guy M. Bradley was an ideal man for the place he filled and it will be hard to replace him, for men of his character and peculiar qualifications are difficult to find.

The saddest part of the story is the result of this sudden and unnecessary death; a young widow is left to struggle alone and care for two fatherless little ones. This poor widowed mother deserves the help of every person who is interested in birds whether as ornithologists or protectors, or both. A fund has been started for the benefit of Mrs. Bradley and her children, and let us hope a large enough sum will be realized to purchase a small annuity or home for them. The readers of 'The Auk' who desire to swell the Bradley Fund may send their contributions to the undersigned.—WILLIAM DUTCHER.

A BRIEF notice was given in the July issue of this Journal (XXII, July, 1905, p. 333) of the Fourth International Ornithological Congress held in London, June 12-17, 1905. Thirty-eight papers were presented, some at general meetings, but the greater part at meetings of the five Sections. A list of the papers here follows:

General Meetings.

Presidential Address. Dr. Richard Bowdler Sharpe.

What Constitutes a Museum Collection of Birds? Frank M. Chapman.
Aasgeier und Kaiseradler um Horst. Dr. Paul Leverkühn.

Stand der Ornithologie in Ungarn. Otto Herman.

Some phases of wear in feathers. Dr. J. Dwight.

Recensio critica automatica of the Doctrine of Bird Migration. Otto Herman.

The first bird-list of Eber and Peucer (1549) and its relation to the "Avium . . . Historia" of Turner. Henry Scherren.

Presentation d'un Atlas des Planches coloriées de Brisson, attribué au peintre Martinet. Dr. Louis Bureau.

Notes on some Experiments in Hybridising Ducks. J. Lewis Bonhote.
Les Correspondances Ornithologiques du Professor Fred. Naumann.
Dr. Paul Leverkühn.

Some Ornithological Results of the Scottish National Antarctic Expedition. William S. Bruce.

On Antarctic Birds. Dr. Edw. A. Wilson.

The Principal Aims of Modern Ornithology. Dr. E. Hartert.

Section I.—Systematic Ornithology, Geographical Distribution, Anatomy and Palæontology. President, Dr. P. L. SCLATER.

On new Neotropical Birds. Count von Berlepsch.

The species of the genus *Elainea*. Count von Berlepsch.

Vortheile und Nachtheile moderner—Arten und Unterarten Beschreibung und Namengebung. Dr. R. Blasius.

La Sterne de Dougall. Dr. Louis Bureau.

Nestling Birds and their Bearing upon the Question of Evolution. W. P. Pycraft.

On the Birds of Madeira. P. Ernesto Schmitz.

Notes on Tyrannidæ. Count von Berlepsch.

Ein letztes Wort über die sogenannte "*Ruticilla cairii*." Hans von Berlepsch.

La perdrix grise des Pyrénées. (*Perdix perdix charrela*.) Dr. Louis Bureau.

The significance of Sequence in moults and plumages. Dr. J. Dwight.

Section II.—Migration. President, OTTO HERMAN.

The unusual Migration of Brünnich's Murre in Eastern North America. J. H. Fleming.

Neuere Beobachtungen über den Herbstzug des Staares in Deutschland. F. Helm.

Section III.—Biology, Nidification, Oology. President, Prof. Dr. FATIO.

On Erythrism in Eggs. Rev. C. R. Jourdain.

Uniform selection of the nest of the Twite (*Acanthis flavirostris*) by the Cuckoo for egg-depositing. William Wilson.

A contribution to the Life History of the American Flamingo. Frank M. Chapman.

Die Pyrenäen und ihre Vogelwelt. Dr. R. Blasius.

A contribution to the Life History of the Brown Pelican. Frank M. Chapman.

**Section IV.—Economic Ornithology and Bird Protection. President,
H. E. DRESSER.**

Reports on Investigation of the Food of Birds since 1900. Otto Herman.

The Usefulness of, and the Harm done by the Sparrow to Agriculturists. Igali Svetozár.

The present state of the Law for the Protection of Birds in Great Britain and Ireland. T. Digby Piggott.

Bird Legislation in Australia. Sir John Cockburn.

La Grosseur des Grêlaux dangereux pour les Oiseaux. Paul Martin.

The Red Grouse in its Economic and Recreative Aspects. William Wilson.

The Rationale of Bird Protection. Frank E. Lemon.

Section V.—Aviculture. President, E. G. B. MEADE-WALDO.

The importance of Aviculture as an Aid to the Study of Ornithology. D. Seth Smith.

In a single-page leaflet entitled 'Legaut's Giant Bird' distributed at the visit of the Congress to Cambridge, though not appearing in the list of papers, Professor Alfred Newton gives his reasons for believing that Legauts' Géant was a Flamingo and not a Ralline bird, and that consequently the genus *Legautia* Schlegel, based on the Géant, has really no foundation. In this view he agrees with Strickland (The Dodo and its Kindred, 1848, p. 60, footnote, and p. 64), who considered the Géant a Flamingo. He adds that "bones of a *Phœnicopterus* have been found in Mauritius," "while among hundreds or even thousands of birds' bones recovered from that island there is not one which can be assigned to a giant Ralline." The genus *Legautia* was founded on the figure of the Géant given in Legaut's 'Voyage,' but subsequent research has shown that this figure was not original, but copied from a drawing by Collaert, who "died more than one hundred and twenty years before Legaut sailed from Europe."

AN ARTICLE in a recent number of the 'Avicultural Magazine' entitled 'The Breeding of Song-Sparrows,' records the mating of a male Pileated Song-Sparrow with a female White-eyebrowed Song-Sparrow, and their successful rearing of young, of course in an aviary. While the fact is in itself of interest, we greatly question whether any readers of 'The Auk' would be able to recognize in the "White-eyebrowed Song-Sparrow" our well-known White-crowned Sparrow without the aid of the technical name, *Zonotrichia leucophrys*, which fortunately accompanies the 'English' name. We have often wondered why it is that English writers

so persistently and methodically ignore the American vernacular names of American birds, when they have occasion to refer to them. It is a general habit of long-standing, so that in citing the present instance there is no intention of criticising the 'Avicultural Magazine,' but merely to call attention to a general practice, not only in reference to birds but to other American animals, for which we have never been able to find a reasonable explanation. We might probably fill pages with lists of names like the case here cited. Our birds have standard vernacular names by which they are known to all American bird students, and being the book names of the birds employed by all American writers they cannot be unknown to intelligent bird students abroad. Where then is the excuse for using a stilted translation, as in the case of the "White-eyed Song-Sparrow," of its Latin specific designation in place of its simple and far more characteristic American name of 'White-crowned Sparrow?' To make matters worse, the species is not even a 'Song-Sparrow,' which is a generic designation applied universally in America to a large group of wholly different birds, to which the White-crowned Sparrow is not closely related. It is the custom of American writers, when referring to the birds of other English speaking countries, to employ the names current in the countries where the birds live, and we do not see why it is not a good method for our English friends to follow when speaking of American birds. If they could bring themselves to do this their references to American birds would often be not only more intelligible but save some annoyance to American readers.

THE TWENTY-THIRD ANNUAL CONGRESS of the American Ornithologists' Union will be held at the American Museum of Natural History, New York City, beginning on the evening of Monday, November 13, 1905. The evening session will be for the election of officers and members, and for the transaction of routine business. Tuesday and the following days the sessions will be for the presentation and discussion of scientific papers, and will be open to the public. Members intending to present communications are requested to forward the titles of their papers to the Secretary, Mr. John H. Sage, Portland, Conn., so as to reach him not later than November 10.

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BRIMLEY, H. H., Raleigh, N. C.....	1904
BROCK, Dr. HENRY HERBERT, 687 Congress St., Portland, Me....	1894
BROOKS, ALLAN, Okanagan Landing, B. C.....	1902
BROOKS, Rev. EARLE AMOS, Waverly, W. Va.....	1892
BROOKS, CLARENCE MORRISON, 105 West St., Keene, N. H.....	1900
BROWN, EDWARD J., Lemon City, Florida.....	1891
BROWN, Miss ELIZABETH V., 1357 Roanoke St, N. W., Washington, D. C.....	1904
BROWN, HUBERT H., Gothic Ave., Toronto Junction, Ontario.....	1889
BROWN, Lewis BOYER, 29 Admiral Road, Toronto, Ontario.....	1904
BROWN, STEWARDSON, 20 E. Penn St., Germantown, Philadelphia, Pa.	1895
BROWN, WILMOT W., Jr., 52 Trowbridge St., Cambridge, Mass.....	1892
BROWNSON, W. H., Advertiser Office, Portland, Me.....	1903
BRYANT, OWEN, 20 St. Botolph St., Boston, Mass.....	1903
BUCK, HENRY ROBINSON, Box 213, Hartford, Conn.....	1897
BUMPUS, Dr. HERMON C., Am. Mus. Natural History, New York City.	1901
BURGESS ALEXANDER M., 54 College St., Providence, R. I.....	1904
BURGESS, JOHN KINGSBURY, Chestnut St., Dedham, Mass.....	1898
BURKE, Wm. BARDWELL, 130 Spring St., Rochester, N. Y.....	1901
BURNETT, WILLIAM L., 128 N. Sherwood St., Fort Collins, Colo....	1895
BURNHAM, JOHN, Jackson, Minn.....	1903
BURTCH, VERDI, Branchport, N. Y.....	1903
BURTIS, HENRY MOTT, Babylon, N. Y.....	1897
BUTLER, Miss CHARLOTTE W., 75 Cabot St., Beverly, Mass.....	1904
BUXBAUM, Mrs. CLARA E., 2305 Niles Ave., St. Joseph, Mich.....	1895
CABOT, LOUIS, Brookline, Mass.....	1904
CALLENDER, JAMES PHILLIPS, 603 Springfield Ave., Summit, N. J..	1903
CAMERON, E. S., V. Ranch, Terry, Montana.....	1903

CARLETON, CYRUS, 69 Vinton St., Providence, R. I.....	1903
CARPENTER, REV. CHARLES KNAPP, Polo, Ill.....	1894
CARR, RUFUS H., 160 Pearl St., Brockton, Mass.....	1904
CARY, MERRITT, Dept. of Agriculture, Washington, D. C.....	1898
CASE, REV. BERT F., Middle Haddam, Conn.....	1903
CASE, CLIFFORD M., 100 Ashley St., Hartford, Conn.....	1892
CASH, HARRY A., 37 N. Main St., Providence, R. I.....	1898
CHAMBERLAIN, CHAUNCY W., 36 Lincoln St., Boston, Mass.....	1885
CHAPIN, PROF. ANGIE CLARA, 25 Freeman Cottage, Wellesley, Mass..	1896
CHASE, MRS. AGNES, 59 Florida Ave., N. W., Washington, D. C...	1896
CHASE, SIDNEY, 346 Beacon St., Boston, Mass.....	1904
CHILDS, JOHN LEWIS, Floral Park, N. Y.....	1900
CHRISTY, BAYARD H., 403 Frederick Ave., Sewickley, Pa.....	1901
CHUBB, SAMUEL H., 468 W. 153d St., New York City.....	1894
CLAPP, MISS MARTHA G. B., 163 East St., Pittsfield, Mass.....	1903
CLARK, AUSTIN HOBART, 107 Audubon Road, Boston, Mass.....	1899
CLARK, EDWARD B., 341 Oak St., Chicago, Ill.....	1900
CLARK, JOSIAH H., 238 Broadway, Paterson, N. J.....	1895
CLARKE, DR. CHARLES K., Toronto Asylum, Toronto, Ont.....	1902
CLARKE, MISS HARRIET E., 9 Chestnut St., Worcester, Mass.....	1896
CLEVELAND, DR. CLEMENT, 59 W. 38th St., New York City.....	1903
COALE, HENRY K., Highland Park, Ill.....	1883
COGGINS, HERBERT LEONARD, 5025 McKean Ave., Germantown, Phila-	1904
delphia, Pa.....	1898
COLBURN, ALBERT E., 1204 Main St., Los Angeles, Cal.....	1891
COLE, ROY NALL, Newnan, Ga.....	1902
COLSON, HAROLD ROY, 15 Walker St., Cambridge, Mass.....	1904
COLVIN, WALTER S., Osawatomie, Kan.....	1896
COMEAU, NAPOLEON A., Godbout, Quebec.....	1885
COMNEY, ARTHUR C., 54 Concord Ave., Cambridge, Mass.....	1901
COMMONS, MRS. F. W., 2437 Park Ave., Minneapolis, Minn.....	1902
CONANT, MRS. THOS. O., 243 W. 98th St., New York City.....	1901
CONGDON, JAMES W., 202 S. 9th St., La Crosse, Wis.....	1902
COOK, MISS LILIAN GILLETTE, 165 W. 82d St., New York City....	1899
COOLIDGE, JOHN TEMPLETON, 3RD, 114 Beacon St., Boston, Mass....	1903
COOLIDGE, PHILIP TRIPP, 17 Garfield St., Watertown, Mass.....	1902
COPE, ALBAN, Butler Hospital, Providence, R. I.....	1885
COPE, FRANCIS R., JR., E. Washington Lane, Germantown, Pa.....	1892
COPELAND, DR. ERNEST, 141 Wisconsin St., Milwaukee, Wis.....	1897
COPELAND, MANTON, 40 Winthrop St., Taunton, Mass.....	1900
COUES, DR. WILLIAM PEARCE, 90 Charles St., Boston, Mass.....	1888
COX, ULYSSES O., 325 Clark St., Mankato, Minn.....	1894
CRAM, R. J., 26 Hancock Ave., W., Detroit, Mich.....	1893
CRANDALL, C. W., 10 Third St., Woodside, N. Y.....	1891
CRANE, MISS CLARA L., Dalton, Mass.....	1904
CRANE, MRS. ZENAS, Dalton, Mass.....	1904
CROLIUS, MISS ANNE A., 815 Carnegie Hall, New York City.....	1897

CROMWELL, JAMES W., 1 Green St., New York City.....	1904
CRONE JOHN VALENTINE, Greeley, Colo.....	1902
CROSBY MAUNSELL S., Rhinebeck, N Y	1904
CUMMINGS, Miss EMMA G., Kennard Road, Brookline, Mass.....	1903
CURRIE, JOHN D., 143 Oliver Ave., N., Minneapolis, Minn.....	1902
CURRIE, ROLLA P. Dept. of Agriculture, Washington, D. C.....	1895
CURRIER EDMONDE SAMUEL, St. Johns, Ore.....	1894
DANIEL, JOHN W., Jr., 1794 Lanier Ave., Washington D. C.....	1895
DART, LESLIE O., 1603 4th Ave. S., Minneapolis Minn.....	1898
DAVENPORT, Mrs. ELIZABETH BRAXTON, 45 Green St., Brattleboro, Vt.....	1898
DAVIS, Miss MARY A., 26 W. 97th St., New York City.....	1898
DAVIS, STEWART Narragansett Pier, R. I	1899
DAVIS, WALTER R. 139 Park St. Newton, Mass.....	1900
DAVISON, DONALD B., 204 Prospect Park, Davenport, Iowa.....	1901
DAWSON, Rev. WILLIAM LEON 5528 Fifteenth Ave., Seattle, Wash....	1895
DAY, CHESTER SESSIONS, 280 Newbury St., Boston, Mass.....	1897
DAY, FRANK MILES, Mt. Airy, Philadelphia, Pa.....	1901
DEAN, R. H., U. S. Weather Bureau, Lexington, Ky.....	1893
DEANE, GEORGE CLEMENT, 80 Sparks St., Cambridge, Mass.....	1899
DEARBORN, NED, Field Columbian Museum, Chicago, Ill.....	1902
DE HAVEN, ISAAC NORRIS, Box 61, Ardmore, Pa.....	1893
DERBY, RICHARD, 3 E. 40th St., New York City.....	1898
DERICKSON, S. H., Lebanon Valley College, Annville, Pa.....	1904
DE VINE, J. L., 5478 Ellis Ave., Chicago, Ill.....	1903
DEWEY, Dr. CHARLES A., 53 S. Fitzhugh St., Rochester, N. Y.....	1900
DIKE, ARCHIE C. Bristol, Vt.....	1903
DILLE, FREDERICK M., 2927 W. 28th Ave., Denver, Colo.....	1892
DIONNE, C. E. Laval Univ., Quebec.....	1893
DIXON, FREDERICK J., Elm Ave., Hackensack, N. J.....	1891
DIXON, JAMES B., R. F. D. Escondido, Ca	1903
DOBBIN, WILLIAM L., 43 Beverley St., Rochester, N. Y.....	1902
DODGE, CHARLES W., Univ. of Rochester Rochester, N. Y.....	1900
DODGE, FRED CLINTON, 125 Milk St., Boston, Mass.....	1897
DODGE, JULIAN M., Wenham Depot, Mass.	1903
DOUBLEDAY, Mrs. FRANK NELSON E. 16th St., New York City..	1897
DOUGHERTY, Col. WILLIAM E., Occidental Hotel, San Francisco, Cal.	1890
DREW, Miss EMMA E., 82 Grant St., Burlington, Vt.....	1904
DROWNE, Dr. FREDERICK PRABODY, 20 Benefit St., Providence, R. I.	1899
DRUMMOND, Miss MARY 208 West St., Wheaton, Ill.....	1904
DUGMORE, ARTHUR RADCLYFFE, Newfoundland, N. J.....	1899
DULL, Mrs. A. P. L., 211 N. Fron St Harrisburg, Pa.....	1900
DURFEE, OWEN, Box 125, Fall River, Mass.....	1887
DUTCHER, Dr. BASH. HICKS, U. S. A., War Dept., Washington, D. C.	1886
DYCHE, Prof. L. L., Lawrence, Kansas.....	1886
DYKE, ARTHUR CURTIS, Bridgewater, Mass.....	1902

EASTMAN, HARRY D., Framingham, Mass.....	1891
EATON, ELON HOWARD, 259 Park Ave., Rochester, N. Y.....	1895
EDDY, NEWELL A., 615 N. Grant Place, Bay City, Mich.....	1885
EDSON, JOHN M., 2210 Victor St., Billingham, Washington.....	1886
EHINGER, Dr. CLYDE, E., 15 Normal Ave., West Chester, Pa.....	1904
EICHE, AUGUST, 1133 O St., Lincoln, Neb.....	1902
EIFRIG, Rev. C. W. GUSTAVE, 210 Wilbrod St., Ottawa, Ont.....	1901
ELLS, GEORGE P., Norwalk, Conn.....	1904
ELROD, Prof. MORTON, Univ. of Montana, Missoula, Montana.....	1892
ELY, Mrs. THEODORE N., Bryn Mawr, Pa.....	1901
EMBODY, GEORGE CHARLES. Bethel College, Russellville, Ky.....	1898
EMERSON, GUY, 685 Boylston St., Boston, Mass.....	1902
EMLÉN, ARTHUR COPE, Awbury, Germantown, Philadelphia, Pa....	1896
EMMET, ROBERT T., New Rochelle, N. Y.....	1904
EMORY, Mrs. MARY DILLE, 156 Foundry St., Morgantown, W. Va....	1899
ENDERS, JOHN O., Box 546, Hartford, Conn.....	1904
EPPINGER, LOUIS J., 299 Gratiot Ave., Detroit, Mich.....	1903
ERICSON, LAWRENCE, 155 Rogers Ave., Brooklyn, N. Y.....	1901
EUSTIS, RICHARD SPELMAN, 11 Wadsworth House, Cambridge, Mass	1903
EVANS, ERNEST MERWYN, Awbury, Germantown, Philadelphia, Pa..	1897
EVANS, WILLIAM B., 205 E. Central Ave., Moorestown, N. J.....	1897
EVERETT, WILLIAM M., 200 W. 99th St., New York City.....	1902
FAIR, PAUL J., 567 Lincoln Ave., Palo Alto, Cal.....	1904
FARLEY, JOHN A., Newton, Mass.....	1904
FARR, MARCUS S., 12 Maple St., Princeton, N. J.....	1900
FARWELL, Mrs. FRANCIS COOLEY, Edgewood, Lake Forest, Ill.....	1898
FARWELL, Mrs. JOHN V., Jr., Edgewood, Lake Forest, Ill.....	1896
FAULKS, EMORY N., 22 Madison Ave., Madison, N. J.....	1902
FELGER, ALVA HOWARD, North Side High School, Denver, Colo....	1898
FELL, Miss EMMA TREGO, 1534 N. Broad St., Philadelphia, Pa....	1903
FERNALD, ROBERT HEYWOOD, Washington Univ., St. Louis, Mo....	1890
FERRY, JOHN FARWELL, 50 State St., Albany, N. Y.....	1894
FIELD, EDWARD BRONSON, Belvedere Apartments, 24 Bancroft St., Toledo, Ohio.....	1898
FINLEY, WILLIAM L., 264 Madison St., Portland, Ore.....	1904
FINNEY, Mrs. WILLIAM W., Churchville, Md.....	1900
FISHER, Miss ELIZABETH WILSON, 1502 Pine St., Philadelphia, Pa....	1896
FISHER, WILLIAM H., 1318 Bolton St., Baltimore, Md.....	1895
FISHER, WILLIAM HUBBELL, 13 Wiggins Block, Cincinnati, Ohio....	1883
FLANAGAN, JOHN H., 392 Benefit St., Providence, R. I.....	1898
FLETCHER, Mrs. MARY E., Fletcher Memorial Library, Ludlow, Vt..	1898
FOOTE, Miss F. HUBERTA, 90 Locust Hill Ave., Yonkers, N. Y.....	1897
FORBES, HENRY S., Milton, Mass.....	1904
FORDYCE, GEO. L., 40 Lincoln Ave., Youngstown, Ohio.....	1901
FOWLER, FREDERICK HALL, 221 Kingsley Ave., Palo Alto, Cal.....	1892

FOWLER, HENRY W., Acad. Nat. Sciences, Philadelphia, Pa.....	1898
FOX, Dr. WILLIAM H., 1826 Jefferson Place, Washington, D. C.....	1883
FRASER, DONALD, Johnstown, N. Y.....	1902
FREEMAN, Miss HARRIET E., 37 Union Park, Boston, Mass.....	1903
FRENCH, CHARLES H., Canton, Mass.....	1904
FULLER, CHARLES ANTHONY, 30 Clinton Road, Brookline, Mass....	1894
FULLER, Miss T. Otis, Needham, Mass.....	1904
GAMMELL, IVES, 170 Hope St., Providence, R. I.....	1903
GANO, Miss LAURA, Richmond, Ind.....	1903
GARDINER, CHARLES BARNES, Norwalk Natl. Bank, Norwalk, Ohio.	1903
GATES, GEORGE B., Madison, S. D.....	1904
GATH, JOHN, Box 354, Torrington, Conn.....	1901
GAUT, JAMES H., Dept. of Agriculture, Washington, D. C.....	1899
GIBSON, LANGDON, 18 Washington Ave., Schenectady, N. Y.....	1904
GIFFORD, EDWARD WINSLOW, Acad. of Sciences, San Francisco....	1904
GILBERT, ARTHUR F., New Bedford, Mass.....	1904
GILLET, LOUIS BLISS, 122 E. 86th St., New York City.....	1895
GILMAN, HARRIS HUNT, Middlesex School, Concord, Mass.....	1903
GLEASON, Rev. HERBERT W., 83 Pinckney St., Boston, Mass.....	1894
GODDARD, F. N., 33 E. 50th St., New York City.....	1901
GOODALE, Dr. JOSEPH LINCOLN, 397 Beacon St., Boston, Mass.....	1885
GOODRICH, JULIET T., 10 Astor St., Chicago, Ill.....	1904
GOODWIN, Miss AMELIA M., 10 Follen St., Cambridge, Mass.....	1904
GOSS, Mrs. ALETTA W., 5475 Ridgewood Court, Chicago, Ill.....	1902
GOULD, JOSEPH E., 640 W. Spring St., Lima, Ohio.....	1889
GRANGER, Miss HELEN, Pierce Hall, Cambridge, Mass.....	1904
GRANGER, WALTER W., Am. Mus. Nat. Hist., New York City.....	1891
GREENOUGH, Mrs. AMELIA P., 377 Beacon St., Boston, Mass.....	1904
GREENOUGH, HENRY VOSE, 45 Carlton St., Brookline, Mass.....	1901
GRIFFING, MOSES BOWDITCH, Shelter Island Heights, N. Y.....	1897
GRIFFITHS, BARTRAM W., 4024 Green St., Philadelphia, Pa.....	1902
GUNNISON, Miss M., Sage College, Ithaca, N. Y.....	1904
HACKENBERG, Rev. JOHN H., 3211 Columbia Ave., Philadelphia, Pa.	1903
HALES, HENRY, Ridgewood, N. J.....	1890
HALL, H. PORTER, Leominster, Mass.....	1904
HALL, CHARLES K., 54 Tweedle Bldg., Albany, N. Y.,.....	1903
HAMBLETON, JAMES CHASE, 212 E. 11th St., Columbus, Ohio.....	1903
HAMFELDT, A., Ottawa, Ill.....	1892
HAMLIN, GEORGE L., Bridgeport, R. F. D. 3, Conn.....	1893
HANKINSON, THOMAS LEROY, Charleston, Ill.....	1897
HANN, HERBERT H., 700 Springfield Ave., Summit, N. J.....	1903
HARRIMAN, Miss CORNELIA, 1 E. 55th St., New York City.....	1899
HARRIMAN, Miss MARY, 229 Madison Ave., New York City.....	1899
HARRIS, JOHN CAMPBELL, 119 S. 16th St., Philadelphia, Pa.....	1903
HARTLEY, INNESS, 159 Grove St., Montclair, N. J.....	1901
HARVEY, Miss RUTH SAWYER, Bond Hill, Cincinnati, Ohio.....	1902
HATHAWAY, HENRY S., Box 498, Providence, R. I.....	1897
HAVEMEYER, H. O., Jr., Mahwah, N. J.....	1893

HAZARD, Hon. R. G., Peace Dale, R. I.....	1885
HEAD, Miss ANNA, 2538 Channing Way, Berkeley, Cal.....	1903
HECOX, Miss LAURA J. F., Light House Keeper, Santa Cruz, Cal.....	1897
HEERMANCE, EDGAR THORNTON, 1178 Sheridan Road, Chicago, Ill.....	1903
HELME, ARTHUR H., Millers Place, N. Y.....	1888
HENDERSON, Judge JUNIUS, Boulder, Colo.....	1903
HENDRICKSON, W. F., 130 12th St., Long Island City, N. Y.....	1885
HENNINGER, Rev. WALTHER F., 206 Jefferson St., Tiffin, Ohio.....	1898
HIGBEE, HARRY G., 13 Austin St., Hyde Park, Mass.....	1900
HILL, ELIZABETH, Sewall, Groton, Mass.....	1904
HILL, JAMES HAYNES, Box 485, New London, Conn.....	1897
HILL, Mrs. THOMAS R., 1825 Greene St., Philadelphia, Pa.....	1903
HINDSHAW, HENRY HAVELOCK, N. Y. State Museum, Albany, N. Y.....	1897
HINE, Prof. JAMES STEWART, Ohio State Univ., Columbus, Ohio.....	1899
HINE, Mrs. JANE L., Sedan, Ind.....	1890
HINTON, Miss SUSAN McV., 41 W. 32d St., New York City.....	1900
HITCHCOCK, FRANK H., Cosmos Club, Washington, D. C.....	1891
HIX, GEORGE E., 114 W. 90th St., New York City.....	1904
HODGE, Prof. CLIFTON FREMONT, Clark Univ., Worcester, Mass.....	1899
HOLDEN, Mrs. EMELINE R., 13 E. 79th St., New York City.....	1902
HOLDEN, Mrs. EDWIN B., 353 Riverside Drive, New York City.....	1903
HOLLAND, Dr. WILLIAM J., Carnegie Museum, Pittsburgh, Pa.....	1899
HOLLISTER, NED, Delavan, Wis.....	1894
HOLLISTER, WARREN D., Continental Oil Co., Denver, Colo.....	1901
HOLMES, LA RUE KLINGLE, Pine Grove Ave., Summit, N. J.....	1902
HOOKER, Mrs. CHARLES PARKER, 67 Chestnut St., Springfield, Mass.....	1903
HORSHERT, HERMAN, 3851a Juniata St., St. Louis, Mo.....	1904
HOWARD, J. STANLEY, 865 Central St., Franklin, Mass.....	1904
HOWARD, OZORA WILLIAM, 853 S. Olive St., Los Angeles, Cal.....	1898
HOWE, CARLTON D., Essex Junction, Vt.....	1901
HOWE, REGINALD HEBER, Jr., Middlesex School, Concord, Mass.....	1895
HOWLAND, RANDOLPH H., 130 Grove St., Montclair, N. J.....	1903
HUARD, Rev. V. A., Public Instruction Dept., Parliamentary Bldg., Quebec, Que.....	1904
HUBBARD, Mrs. SARA A., Glendale, Cal.....	1891
HUBEL, FREDERICK C., 112 Alexandrine Ave., W., Detroit, Mich.....	1903
HUGHES, Dr. WILLIAM E., 3945 Chestnut St., Philadelphia, Pa.....	1891
HULL, WALTER B., Box 1234, Milwaukee, Wis.....	1889
HUNN, JOHN T. SHARPLESS, 1218 Prospect Ave., Plainfield, N. J.....	1895
HUNT, CHRESWELL J., 1306 N. 53rd St., West Philadelphia, Pa.....	1902
HUNTER, W. D., Box 174, Victoria, Texas.....	1899
HYDE, Miss HAZEL RODGERS, 45 Pine St., Waterbury, Conn.....	1902
INGALLS, CHARLES E., East Templeton, Mass.....	1885
INGERSOLL, ALBERT M., 818 5th St., San Diego, Cal.....	1885
IRVING, JOHN, 550 Park Av., New York City.....	1894
ISHAM, C. B., 30 E. 63d St., New York City.....	1891
JACKSON, THOMAS H., 343 E. Biddle St., West Chester, Pa.....	1888

JAGER, H. J., 416 Glendale Ave., Owatonna, Minn.....	1904
JACOBS, J. WARREN, Waynesburg, Pa.....	1889
JANNEY, NATHANIEL E., 112 Drexel Bldg., Philadelphia, Pa.....	1899
JENKINS, HUBERT OLIVER, Stanford University, Cal.....	1902
JOHNSON, EVERETT EDWIN, East Hebron, Me.....	1896
JOHNSON, FRANK EDGAR, Coney Island Ave. and Ave L., Brooklyn, N. Y.....	1888
JOHNSON, JAMES HOWARD, Bradford, N. H.....	1894
JOHNSON, WALTER ADAMS, 133 E. 16th St., New York City.....	1898
JOHNSON, WILLIAM S., Boonville, N. Y.....	1893
JORDAN, A. H. B., Lowell, Wash.....	1888
JUDD, ELMER T., Cando, N. D.....	1895
KAY, JOHN WILBUR, 62 Selden Ave., Detroit, Mich.....	1904
KAY, WALLACE G., 62 Selden Ave., Detroit, Mich.....	1904
KEAYS, JAMES EDWARD, 328 St. George St., London, Ontario.....	1899
KEIM, THOMAS DANIEL, 405 Radcliffe St., Bristol, Pa.....	1902
KELKER, WILLIAM A., Box 114, Harrisburg, Pa.....	1896
KELLOGG, Prof. VERNON L., Stanford University, Cal.....	1888
KENDALL, Miss BLANCHE, 20 Dudley St., Brookline, Mass.....	1904
KENDALL, Dr. WILLIAM C., U. S., Bureau of Fisheries, Washington, D. C.....	1886
KENNARD, FREDERIC HEDGE, Brookline, Mass.....	1892
KERMODE, FRANCIS, Curator Provincial Museum, Victoria, B. C...1904	
KEYES, Prof. CHAS. R., Mt. Vernon, Ia.....	1904
KEYSER, Rev. LEANDER S., 108 Third St., W., Canal Dover, Ohio....1891	
KING, GEORGE GORDON, 16 E. 84th St., New York City.....	1888
KING, LE ROY, 20 E. 84th St., New York City.....	1901
KIRKHAM, Mrs. JAMES W., 275 Maple St., Springfield, Mass.....	1904
KIRKWOOD, FRANK C., 1811 Maryland Ave., Baltimore, Md.....	1892
KLUGH, A. B., Wellington Field Nat. Club, Guelph, Ont.....	1904
KNETSCH, ROBERT, Fort Worth, Tex.....	1898
KNIGHT, ORA WILLIS, 84 Forest Ave., Bangor, Me.....	1893
KNOLHOFF, FERDINAND WILLIAM, 28 Winans St., East Orange, N. J.1897	
KOBBE, WILLIAM H., 125 High St., New Haven, Conn.....	1898
KOCH, Prof. AUGUST, Williamsport, Pa.....	1891
KOHN, GUSTAVE, 136 Carondelet St., New Orleans, La.....	1886
KOPMAN, HENRY HAZLITT, 394 Broadway, New Orleans, La.....	1899
KUNHARDT, Mrs. H. R., 124 W. 74th St., New York City.....	1904
LACEY, HOWARD GEORGE, Kerrville, Texas.....	1899
LANG, D., Central High School, St. Paul, Minn.....	1904
LANO, ALBERT, Aitkin, Minn.....	1890
LANTZ, Prof. DAVID ERNEST, Dept. of Agriculture, Washington, D. C.1885	
LARKIN, HARRY H., 237 North St., Buffalo, N. Y.....	1903
LARRABEE, AUSTIN P., Gardiner, Me.....	1902
LATIMER, Miss CAROLINE P., 19 Pierpont St., Brooklyn, N. Y.....	1898
LAURENT, PHILIP, 31 E. Mt. Airy Ave., Mt. Airy, Philadelphia, Pa..1902	
LEE, Prof. LESLIE ALEXANDER, 3 Bath St., Brunswick, Me.....	1903

LEUTLOFF, HERMAN C. A., 666 E. 135th St., New York City.....	1896
LEVERING, THOMAS HENRY, 1627 Howard Ave., Washington, D. C..	1898
LEVERSON, Dr. MONTAGUE R., 81 Lafayette Ave., Brooklyn, N. Y...	1901
LIBBY, ORIN GRANT, Grand Forks, N. Dakota.....	1900
LINCOLN, ALBERT L., Walnut Place, Brookline, Mass.....	1904
LINTON, Miss MARY J., 163 East St., Pittsfield, Mass.....	1903
LIVERMORE, JOHN R., Forest View Farm, Katonah, N. Y.....	1904
LLOYD, ANDREW JAMES, 315 Washington St., Boston, Mass.....	1900
LOOMIS, JOHN A., Mereta, Texas	1887
LORD, Rev. WILLIAM R., Rockland, Mass.	1901
LORING, J. ALDEN, Owego, New York.....	1889
LOUCKS, WILLIAM E., Care of J. K. Armsby Co., 134 Market St., San Francisco, Cal.....	1902
LOWE, WILLOUGHBY P., Okehampton, Devon, England.....	1893
LUCE, PERCIVAL DE, 114 E. 23d St., New York City.....	1904
LUM, EDWARD H., Chatham, N. J.....	1904
LYMAN, Miss EMILY R., 121 N. 18th St., Philadelphia, Pa.....	1903
MACDOUGALL, GEORGE R., 131 W. 73rd St., New York City.....	1890
MADDOCK, Miss EMELINE, Care of Mrs. Loring, Merion, Pa.....	1897
MAHER, J. E., Windsor Locks, Conn.....	1902
MAITLAND, ROBERT L., 45 Broadway, New York City.....	1889
MALDE, O. G., Agric. Exper. Sta., Madison, Wis.....	1904
MANN, JAMES R., Arlington Heights, Mass.....	1903
MARCH, Prof. JOHN LEWIS, Care of C. Gano, Easton, Pa.....	1903
MARRS, Mrs. KINGSMILL, South Park, Saxonville, Mass.....	1903
MARSDEN, H. W., Palmerlee, Ariz.....	1904
MARSH, DANIEL J., Springfield, Mass.....	1894
MARTIN, Miss MARIA ROSS, Box 365, New Brunswick, N. J.....	1902
MASTERMAN, ELMER ELLSWORTH, R. F. D. 2 New London, Ohio....	1895
MATHEWS, Miss CAROLINE, 41 Cool St., Waterville, Me.....	1898
MCATEE, WALDO LEE, Dept. of Agriculture, Washington, D. C.....	1903
MCCLINTOCK, NORMAN, Amberson Ave., Pittsburgh, Pa.....	1900
MCCONNELL, HARRY B., Cadiz, O.....	1904
MCCOOK, PHILIP JAMES, 15 William St., New York City.....	1895
MC EWEN, DANIEL C., 160 Stirling Pl., Brooklyn, N. Y.....	1901
MCHATTON, Dr. HENRY, Macon, Ga.....	1895
MCILHENNY, EDWARD AVERY, Avery Island, La.....	1894
MCKECHNIE, FREDERICK BRIDGHAM, Ponkapog, Mass.....	1900
MCLAIN, ROBERT BAIRD, Market and 12th Sts., Wheeling, W. Va....	1893
McMILLAN, Mrs. GILBERT, Gorham, N. H.....	1902
McNULTY, HENRY A., Gen. Theol. Seminary, Chelsea Sq., N. Y. City.	1900
MEAD, Mrs. E. M., 2465 Broadway, New York City.....	1904
MEARNS, LOUIS DE ZEREGA, 313 S. Court St., Circleville, Ohio.....	1899
MEEKER, JESSE C. A., Box 163 Danbury, Conn.....	1899
MERRILL, HARRY, Bangor, Maine.....	1883
MILLER, FRANK M., 309 Hibernia Bank Bldg., New Orleans, La.....	1901
MILLER, GERRIT SMITH, Jr., U. S. Nat. Mus., Washington, D. C....	1886

MILLER, JAMES HENRY, Lowville, N. Y.....	1904
MILLER, Miss MARY MANN, Glendale, Cal.....	1898
MILLER, WALDRON DE WITT, 309 E. 7th St., Plainfield, N. J.....	1896
MILLS, HARRY C., Box 218, Unionville, Conn.....	1897
MILLS, Prof. WILLIAM C., Ohio State Univ., Columbus, O.....	1900
MITCHELL, Mrs. MINA BAKER, Care of Plow Co., Chattanooga, Tenn.....	1898
MITCHELL, Dr. WALTON I., 202 Levy Bldg., Galveston, Tex.....	1893
MONTGOMERY, THOMAS H., Jr., Univ. of Texas, Austin, Texas.....	1899
MOORE, ROBERT THOMAS, W. Main St. Haddonfield, N. J.....	1898
MORCOM, G. FREAN, 726 Lake St., Los Angeles, Cal.....	1886
MORGAN, ALBERT, Hartford Fire Insurance Co., Hartford, Conn....	1903
MORSE, GEORGE W., Moberly, Mo.....	1898
MORTON, Dr. HOWARD MCILVAIN, 316 Clifton Av., Minneapolis, Minn.....	1900
MOSLE, Mrs. GEORGE R., 301 West End Ave., New York City.....	1904
MUMMERY, EDWARD G., 24 E. Atwater St., Detroit, Mich.....	1902
MUNRO, JAMES A., 26 Wellington St. W., Toronto, Ont.....	1904
MURPHY, Dr. EUGENE E., 444 Telfair St., Augusta, Ga.....	1903
MYERS, Miss LUCY F., "Brookside," Poughkeepsie, N. Y.....	1898
NASH, HERMAN W., Box 264, Pueblo, Colo.....	1892
NELSON, JAMES ALLEN, 317 E. Buffalo St., Ithaca, N. Y.....	1898
NEWMAN, Rev. STEPHEN M., 1818 M. St., N. W., Washington, D. C.....	1898
NICHOLS, JOHN M., 46 Spruce St., Portland, Me.....	1890
NICHOLS, JOHN TREADWELL, 42 W. 11th St., New York City.....	1901
NICHOLS, WILLIAM E., 15 Wall St., New York City.....	1904
NOLTE, Rev. FELIX, St. Benedict's College, Atchison, Kan.....	1903
NORRIS, J. PARKER, 723 Walnut St., Philadelphia, Pa.....	1886
NORRIS, ROY C., 725 N. 10th St., Richmond, Ind.....	1904
NOWELL, JOHN ROWLAND, Box 979, Schenectady, N. Y.....	1897
O'CONNOR, HALDEMAN, 25 N. Front St., Harrisburg, Pa.....	1896
OGDEN, Dr. HENRY VINING, 141 Wisconsin St., Milwaukee, Wis.....	1897
OLCOTT, THEODORE F., 323 Decatur St., Brooklyn, N. Y.....	1901
OLDYS, HENRY, Dept. of Agriculture, Washington, D. C.....	1896
OLIVER, DANIEL LEET, 701 Ridge Ave., Allegheny, Pa.....	1902
OLIVER, Dr. HENRY KEMBLE, 2 Newbury St., Boston, Mass.....	1900
ORMSBEE, Miss CARRIE W., Brandon, Vt.....	1904
OSGOOD, HENRY W., Pittsfield, N. H.....	1901
OSGYANI, A., 367 Union Ave., Bridgeport, Conn.....	1904
OWEN, Miss JULIETTE AMELIA, 306 N. 9th St., St. Joseph, Mo.....	1897
PADDOCK, Miss ISABEL M., Fairbank's Museum, St. Johnsbury, Vt.	
PAGE, Mrs. ALICE WILSON, Englewood, N. J.....	1896
PAINE, AUGUSTUS G., Jr., 126 E. 39th St., New York City.....	1886
PALMER, SAMUEL COPELAND, Swarthmore, Pa.....	1899
PARKE, LOUIS T., 4039 Spruce St., Philadelphia, Pa.....	1903
PARKER, Hon. HERBERT, S. Lancaster, Mass.....	1904
PATTEN, Mrs. JOHN D. H., 2212 R St. N. W., Washington, D. C.....	1900
PAULMIER, FREDERICK CLARK, State Museum, Albany, N. Y.....	1902
PEABODY, Rev. P. B., New Castle, Wyo.....	1903

PEABODY, WILLIAM RODMAN, 70 State St., Boston, Mass.....	1890
PEAKE, E. E., Salem, Ill.....	1904
PEAVEY, ROBERT W., 107 Euclid Ave., Brooklyn, N. Y.....	1903
PECK, CLARK J., 6728 Leeds St., W. Philadelphia, Pa.....	1904
PECK, HENRY O., 62 Pomeroy Ave., Pittsfield, Mass.....	1904
PERRY, ELTON, 1142 Madison Ave., New York City.....	1902
PETERS, JAMES LEE, Walnut Ave., Jamaica Plain, Mass.....	1904
PETERSON, CYRUS A., 8 Shaw Place, St. Louis, Mo.....	1904
PETTIS, Miss GRACE L., Museum Nat. Hist., Springfield, Mass.....	1903
PHELPS, Mrs. J. W., Box 36, Northfield, Mass.....	1899
PHILLIPS, ALEXANDER H., Princeton, N. J.....	1891
PHILLIPS, JOHN CHARLES, 299 Berkeley St., Boston, Mass.....	1904
PHILLIPS, SHERMAN E., Rochester, N. H.....	1904
PIERCE, A. K., Renovo, Pa.....	1891
POE, Miss MARGARETTA, 1500 Park Ave., Baltimore, Md.....	1899
POMEROY, Miss GRACE V., Summit, N. J.....	1904
POMEROY, HARRY KIRKLAND, Box 575, Kalamazoo, Mich.....	1894
POOLE, ALFRED D., 401 W. 7th St., Wilmington, Delaware.....	1901
PORTER, LOUIS H., Stamford, Conn.....	1893
PRAEGER, WILLIAM E., 5535 Monroe Ave., Chicago, Ill.....	1892
PRATT, Rev. GEORGE B., 207 Warren Ave., Chicago, Ill.....	1904
PROCTER, JAMES N., R. F. D. 2, Ventura, Cal.....	1904
PURDUM, Dr. C. C., Tyler Bldg., Pawtucket, R. I.....	1901
PURDY, JAMES B., Plymouth, Mich.....	1893
RANN, Mrs. MARY L., Manchester, Iowa.....	1893
RAUB, Dr. M. W., 340 W. King St., Lancaster, Pa.....	1890
RAWSON, CALVIN LUTHER, Box 33, Norwich, Conn.....	1885
READ, ALBERT M., 1140 15th St. N. W., Washington, D. C.....	1895
REAGH, Dr. ARTHUR LINCOLN, 39 Maple St., West Roxbury, Mass...	1896
REDFIELD, Miss ELISA WHITNEY, 1925 Massachusetts Ave., Cam- bridge, Mass.....	1897
REDINGTON, ALFRED POETT, Box 66, Santa Barbara, Cal.....	1890
REED, CHESTER A., Worcester, Mass.....	1904
REED, Miss EMILY E., 12 Louisburg Sq., Boston, Mass.....	1904
REED, HUGH DANIEL, 804 E. Seneca St., Ithaca, N. Y.....	1900
REED, Mrs. WILLIAM HOWELL, 218 Commonwealth Ave., Boston, Mass.....	1904
REHN, JAMES A. G., Acad. Nat. Sciences, Philadelphia, Pa.....	1901
REYNOLDS, GEORGE H., 357 Maple St. Springfield, Mass.....	1904
RHOADS, CHARLES J., Bryn Mawr, Pa.....	1895
RIBYN, ALBERT L., 118 N. 8th St., St. Charles, Mo.....	1903
RICHARD, WILLIAM, Waterford, N. J.....	1904
RICHARDS, Miss HARRIET E., 36 Longwood Ave., Brookline, Mass...	1900
RICHARDS, JOHN BION, Box 32, Fall River, Mass.....	1888
RICHARDSON, C. H., Jr., 435 S. El Molino Ave., Pasadena, Cal.....	1903
RICHARDSON, JOHN KENDALL, Wellesley Hills, Mass.....	1896
RICKER, EVERETT WILDER, Box 5083, Boston, Mass.....	1894

RIDGWAY, JOHN L., Chevy Chase, Md.....	1890
RIKER, CLARENCE B., 48 Vesey St., New York City.....	1885
RILEY, JOSEPH H., Falls Church, Va.....	1897
RITCHIE, SANFORD, Dover, Me.....	1900
ROBBINS, REGINALD C., 373 Washington St., Boston, Mass.....	1901
ROBERTS, WILLIAM ELY, West Chester, Pa.....	1902
ROBERTSON, HOWARD, Station A, Box 55, Los Angeles, Cal.....	1901
ROBINS, Mrs. EDWARD 114 S. 21st St., Philadelphia, Pa.....	1895
ROBINSON, ANTHONY W., 409 Chestnut St., Philadelphia, Pa.....	1903
RODDY, Prof. H. JUSTIN, State Normal School, Millersville, Pa.....	1891
ROGERS, CHARLES H., Crosswicks, N. J.....	1904
ROOSEVELT, FRANKLIN DELANO, Hyde Park, N. Y.....	1896
ROOSEVELT, THEODORE, Jr., White House, Washington, D. C.....	1902
ROSS, G. H., Rutland, Vt.....	1904
ROWLEY, JOHN, Jr., Hastings-on-Hudson, N. Y.....	1889
SABINE, GEORGE K., 30 Irving St., Brookline, Mass.....	1903
SAGE, HENRY M., Menands Road, Albany, N. Y.....	1885
SAMPSON, WALTER BEHRNARD, 36 S. California St., Stockton, Cal...	1897
SAND, ISABELLA LOW, Ardsley-on-Hudson, N. Y.....	1902
SANDS, AUSTIN LEDYARD, Greenough Place, Newport, R. I.....	1902
SANFORD, Dr. LEONARD C., 216 Crown St., New Haven, Conn.....	1902
SAVAGE, WALTER GILES, Monteer, Mo.....	1898
SCHMITT, DR. JOSEPH, Anticosti Island, Quebec.....	1901
SCHMUCKER, Dr. S. C., 610 S. High St., West Chester, Pa.....	1903
SCHOENEBECK, AUGUST JOHN, R. F. D. 1, Lena, Wis.....	1898
SCHUTZE, ADOLPH E., 2306 Guadalupe St., Austin, Texas.....	1903
SCHWARZ, FRANK, 1520 Lafayette Ave. St. Louis, Mo.....	1904
SEALE, ALVIN, Stanford University, Cal.....	1900
SEISS, COVINGTON FEW, 1338 Spring Garden St., Philadelphia, Pa...	1898
SEVERSON, HENRY P., Winneconne, Wis.....	1902
SHATTUCK, EDWIN HAROLD, Granby, Conn.....	1898
SHAW, HOLTON A., 610 4th Ave., Grand Forks, N. Dakota.....	1898
SHEIBLEY, S. B., Dept. of Justice, Washington, D. C.....	1903
SHERRILL, W. E., Haskell, Texas.....	1896
SHOEMAKER, FRANK H., Care of Gen. Auditor U. P. R. R. Co., Omaha, Neb.....	1895
SHROSBREE, GEORGE, Public Museum, Milwaukee, Wis.....	1899
SILLIMAN, HARPER, 562 5th Ave., New York City.....	1902
SMITH, CHARLES PIPER, 2106 Central Ave., Indianapolis, Ind.....	1898
SMITH, Rev. FRANCIS CURTIS, Boonville, N. Y.....	1903
SMITH, HORACE G., 2918 Lafayette St., Denver, Colo.....	1888
SMITH, Dr. HUGH M., 1209 M St. N. W., Washington, D. C.....	1886
SMITH, LOUIS IRVIN, Jr., 3908 Chestnut St., Philadelphia, Pa.....	1901
SMITH, PHILO W., JR., Mona House, St. Louis, Mo.....	1903
SMITH, THEODORE H., 173 Prospect St., East Orange, N. J.....	1896
SMYTH, Prof. ELLISON A., Jr., Polytechnic Inst., Blacksburg, Va.....	1892
SNOW, Prof. FRANCIS H., Univ. of Kansas, Lawrence, Kan.....	1903

- SNYDER, WILL EDWIN, 109 E. Mackie St., Beaver Dam, Wis.....1895
 SOELNER, GEORGE W. H., 1513 Meridian St., N. W., Washington.
 D. C.....1903
 SPAID, Prof. ARTHUR R., 1819 Delaware Ave., Wilmington, Del.....1901
 SPAULDING, FRED B., Lancaster, N. H.....1894
 SPINNEY, HERBERT L., Seguin Light Station, Popham Beach, Me...1900
 SPROULL, Mrs. GRACE H., Creston, O.....1903
 STANTON, Prof. J. Y., 410 Main St., Lewiston, Me.....1883
 STAPLETON, RICHARD P., 235 High St., Holyoke, Mass.....1904
 STEBBINS, Miss FANNIE A., 480 Union St., Springfield, Mass.....1903
 STEPHENSON, Mrs. LOUISE MCGOWN, Helena, Ark.....1894
 STILLMAN, WILLIAM M., 426 W. 7th St., Plainfield, N. J.....1904
 STOCKARD, CHARLES RUPERT, 519 W. 123d St., New York City....1904
 STONE, CLARENCE F., Branchport, N. Y.....1903
 STONE, DWIGHT D., R. F. D. 3, Oswego, N. Y.....1891
 STROUT, CHARLES S., 207 Alfred St., Biddeford, Me.....1904
 STURGIS, Mrs. F. L., 3 W. 36th St., New York City.....1904
 STURTEVANT, EDWARD, St. George School, Newport, R. I.....1896
 STYER, Mrs. KATHARINE R., Concordville, Pa.....1903
 SURFACE, HARVEY ADAM, Office of State Zoölogist, Harrisburg, Pa..1897
 SWAIN, JOHN MERTON, 10 Bush St., Skowhegan, Me.....1899
 SWALES, BRADSHAW HALL, 145 Gladstone Ave., Detroit, Mich.....1902
 SWARTH, HARRY S., 356 Belden Ave., Chicago, Ill.....1900
 SWENK, MYRON H., 1821 O St., Lincoln, Neb.....1904
 SWEZEY, GEORGE, 61 Polk St., Newark, N. J.....1901
 TAVERNER, PERCY A., 30 Hodges Bldg., Detroit, Mich.....1902
 TAYLOR, ALEXANDER O'DRISCOLL, 11 Francis St., Newport, R. I....1888
 TEST, Dr. FREDERICK CLEVELAND, 4401 Indiana Ave., Chicago, Ill..1892
 THACHER, Mrs. THOMAS W., 21 Dwight St., Brookline, Mass.....1904
 THAYER, JOHN ELIOT, Lancaster, Mass.....1898
 THOMAS, Miss EMILY HINDS, Bryn Mawr, Pa.....1901
 THOMPSON, Miss CAROLINE BURLING., Wellesley College, Wellesley,
 Mass.....1900
 THOMPSON, Dr. M. T., Clark University, Worcester, Mass.....1904
 TOPPAN, GEORGE L., 18 E. 23d St., New York City.....1886
 TOWNSEND, Dr. CHAS. WENDELL, 76 Marlborough St., Boston, Mass.1901
 TOWNSEND, WILMOT, 3d Ave. and 75th St., Brooklyn, N. Y.....1894
 TROTTER, WILLIAM HENRY, 36 N. Front St., Philadelphia, Pa.....1899
 TUDBURY, WARREN C., 47 W. 126th St., New York City.....1903
 TUFTS, LE ROY MELVILLE, Farmington, Me.....1903
 TURNER, HOWARD M., 10 Francis Ave., Cambridge, Mass.....1903
 TUTTLE, Dr. CARL, Berlin Heights, Ohio.....1890
 TWEEDY, EDGAR, 336 Main St., Danbury, Conn.....1902
 UNDERWOOD, WILLIAM LYMAN, Mass. Inst. Technology, Boston, Mass.1900
 VAN CORTLANDT, Miss ANNE S., Croton-on-Hudson, N. Y.....1885
 VAN DENBURGH, Dr. JOHN, 406 Sutter St., San Francisco, Cal.....1893
 VAN HUYCK, JOHN MASON, Lee, Mass.....1904

VAN NAME, WILLARD GIBBS, 121 High St., New Haven, Conn.....	1900
VAN NORDEN, WARNER MONTAGNIE, Rye, New York.....	1899
VAN SANT, Miss ELIZABETH, 2960 Dewey Ave., Omaha, Neb.....	1896
VARICK, Mrs. WILLIAM REMSEN, 1015 Chestnut St., Manchester, N. H.	1900
VETTER, Dr. CHARLES, 152 Second St., New York City.....	1898
VISHER, STEPHEN S., Forestburg, S. Dakota.....	1904
WALES, EDWARD H., Hyde Park, N. Y.....	1896
WALKER, Dr. R. L., 355 Main Ave., Carnegie, Pa.....	1888
WALLACE, Miss LOUISE BAIRD, Mt. Holyoke College, South Hadley, Mass.....	1903
WALLINGFORD, LEO, 118 S. Black St., Alexandria, Ind.....	1904
WALTER, HERBERT E., 401 Broadway, Cambridge, Mass.....	1901
WALTERS, FRANK, 7 W. 103d St., New York City.....	1902
WARREN, Dr. B. H., Box 245, West Chester, Pa.....	1885
WARREN, EDWARD ROYAL, 20 W. Caramillo St., Colorado Springs, Colo.....	1902
WATSON, Miss SARAH R., Care of Robt. S. Newhall, Mt. Airy, Philadelphia, Pa.....	1900
WEBSTER, Mrs. MARY P., 1025 5th St., S. E., Minneapolis, Minn....	1900
WEIR, J. ALDEN, 11 E. 12th St., New York City.....	1899
WELLS, FRANK S., 916 Grant Ave., Plainfield, N. J.....	1902
WENTWORTH, IRVING H., Matehuala, E. de S. L. P., Mexico.....	1900
WEST, JAMES A., 33 John St., Champaign, Ill.....	1896
WEST, LEWIS H., Roslyn, N. Y.....	1887
WESTFELDT, GUSTAF REINHOLD, Box 601, New Orleans, La.....	1902
WETMORE, Mrs. EDMUND, 343 Lexington Ave., New York City.....	1902
WHEELER, EDMUND JACOB, Pequot Ave., New London, Conn.....	1898
WHEELER, JOHN B., East Templeton, Mass.....	1897
WHEELER, WILLIAM A., East Templeton, Mass.....	1904
WHEELLOCK, Mrs. IRENE G., 1040 Hinman Ave., Evanston, Ill.....	1902
WHITCOMB, Mrs. HENRY F., 721 Franklin St., Milwaukee, Wis.....	1897
WHITE, FRANCIS BEACH, 6 Phillips Place, Cambridge, Mass.....	1891
WHITE, GEORGE R., P. O. Dept., Ottawa, Ont.....	1903
WHITE, W. A., 158 Columbia Heights, Brooklyn, N. Y.....	1902
WICKERSHAM, CORNELIUS W., 22 Apley Court, Cambridge, Mass.....	1902
WICKS, M. L., Jr., 65 Madison St., Memphis, Tenn.....	1890
WILBUR, ADDISON P., 4 Gibson St., Canandaigua, N. Y.....	1895
WILCOX, T. FERDINAND, 115 W. 75th St., New York City.....	1895
WILDE, MARK L. C., 315 N. 5th St., Camden, N. J.....	1893
WILLIAMS, J. BICKERTON, 24 Ann St., Toronto, Ontario.....	1889
WILLIAMS, RICHARD FERDINAND, Box 521, New York City.....	1902
WILLIAMS, ROBERT W., Jr., Tallahassee, Fla.....	1900
WILLIAMSON, E. B., Bluffton, Ind.....	1900
WILSON, SIDNEY S., 310 S. 11th St., St. Joseph, Mo.....	1895
WINSLETT, Miss MARY E., Stevensville, Mont.....	1904
WISLER, J. JAY, 231 Cherry St. Columbia, Pa.....	1903
WISTER, WILLIAM ROTCH, 131 S. 5th St., Philadelphia, Pa.....	1904

Deceased Members.

WOLFE, WILLIAM EDWARD, Wray, Colo.....	1900
WOOD, J. CLAIRE, 179 17th St., Detroit, Mich.....	1902
WOOD, NELSON R., Smithsonian Institution, Washington, D. C.....	1895
WOOD, NORMAN A., 1216 S. University Ave., Ann Arbor, Mich.....	1904
WOOD, S. T., The Globe, Toronto, Ont.....	1904
WOODCOCK, ARTHUR ROY, 610 Chamber of Commerce, Portland, Oregon.....	1901
WOODRUFF, EDWARD SEYMOUR, 14 E. 68th St., New York City.....	1899
WOODRUFF, FRANK M., Acad. Sciences, Chicago, Ill.....	1904
WOODRUFF, LEWIS B., 14 E. 68th St., New York City.....	1886
WOODWORTH, Mrs. NELLY HART, 41 Bank St., St. Albans, Vt.....	1894
WORTHEN, CHARLES K., Warsaw, Ill.....	1891
WORTHINGTON, WILLIS W., Shelter Island Heights, N. Y.....	1889
WRIGHT, HORACE WINSLOW, 82 Myrtle St., Boston, Mass.....	1902
WRIGHT, SAMUEL, Conshohocken, Pa.....	1895
ZERRAHN, CARL OTTO, Milton, Mass.....	1904

DECEASED MEMBERS.

FELLOWS.

Date of Death

BAIRD, SPENCER FULLERTON.....	Aug. 19, 1887
BENDIRE, CHARLES E.....	Feb. 4, 1897
COUES, ELLIOTT.....	Dec. 25, 1899
GOSS, N. S.....	March 10, 1891
HOLDER, JOSEPH B.....	Feb. 28, 1888
JEFFRIES, JOHN AMORY.....	March 26, 1892
McILWRAITH, THOMAS.....	Jan. 31, 1903
MERRILL, JAMES C.....	Oct. 27, 1902
SENNETT, GEORGE BURRITT.....	March 18, 1900
TRUMBULL, GURDON.....	Dec. 28, 1903
WHEATON, JOHN M.....	Jan. 28, 1887

HONORARY FELLOWS.

BURMEISTER, HERMANN.....	May 1, 1892
GÄTKE, HEINRICH.....	Jan. 1, 1897
GUNDLACH, JUAN.....	March 14, 1896
GURNEY, JOHN HENRY.....	April 20, 1896
HARTLAUB, GUSTAV.....	Nov. 20, 1900
HUXLEY, THOMAS H.....	June 29, 1895
KRAUS, FERDINAND.....	Sept. 15, 1890
LAWRENCE, GEORGE N.....	Jan. 17, 1895
MILNE-EDWARDS, ALPHONSE.....	April 21, 1900

Deceased Members.

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PARKER, WILLIAM KITCHEN.....	July 3, 1890
PELZELN, AUGUST VON.....	Sept. 2, 1891
SALVIN, OSBERT.....	June 1, 1898
SCHLEGEL, HERMANN.....	Jan. 17, 1884
SIEBOHM, HENRY.....	Nov. 26, 1895
TACZANOWSKI, LADISLAS.....	Jan. 17, 1890

CORRESPONDING FELLOWS.

ALTUM, C. A.....	Jan. 1, 1900
ANDERSON, JOHN.....	Aug. 16, 1900
BALDAMUS, EDUARD.....	Oct. 30, 1893
BLAKISTON, THOMAS W.....	Oct. 15, 1891
BOGDANOW, MODEST N.....	March 4, 1888
BRYANT, WALTER, E.....	May 21, 1905
COOPER, JAMES G.....	July 19, 1902
CORDEAUX, JOHN.....	Aug. 1, 1899
DAVID, ARMAND.....	Nov. 10, 1900
HAAST, JULIUS VON.....	Aug. 15, 1887
HARGITT, EDWARD.....	March 19, 1895
HOLUB, EMIL.....	Feb. 21, 1902
HOMEYER, E. F. VON.....	May 31, 1889
LATARD, EDGAR LEOPOLD.....	Jan. 1, 1900
LYTTLETON, THOMAS, LORD LILFORD.....	June 17, 1896
MARSCHALL, A. F.....	Oct. 11, 1887
MAI MGREN, ANDERS JOHAN.....	April 12, 1897
MIDDENDORFF, ALEXANDER THEODOR VON.....	Jan. 28, 1894
MOSJISOVICS, F. G. HERMANN AUGUST.....	Aug. 27, 1897
PHILIPPI, R. A.....	Aug. — 1904
PREJEVALSKI, N. M.....	Oct. 20, 1887
PRENTISS, D. WEBSTER.....	Nov. 19, 1899
PRYER, HARRY JAMES STOVIN.....	Feb. 17, 1888
RADDE, GUSTAV FERDINAND.....	— 1903
SCHIRENCK, LEOPOLD VON.....	Jan. 20, 1894
SÉLEYS-LONGSCHAMPS, EDMOND DE.....	Dec. 11, 1900
SEVERTZOW, N.....	Feb. 8, 1885
STEVENSON, HENRY.....	Aug. 18, 1888
WHARTON, HENRY T.....	Sept. —, 1895
WOODHOUSE, SAMUEL W.....	Oct. 23, 1904

MEMBERS.

ADAMS, CHARLES F.....	May 20, 1893
ALLEN, CHARLES SLOVER.....	Oct. 15, 1893
ATKINS, H. A.....	May 19, 1885

AVERY, WILLIAM CUSHMAN.....	March 11, 1894
BARLOW, CHESTER.....	Nov. 6, 1902
BAUR, GEORGE.....	June 25, 1898
BECKHAM, CHARLES WICKLIFFE.....	June 8, 1888
BILL, CHARLES.....	April —, 1897
BIRTWELL, FRANCIS JOSEPH.....	June 29, 1901
BOARDMAN, GEORGE A.....	Jan. 11, 1901
BOLLES, FRANK.....	Jan. 10, 1894
BRACKETT, FOSTER H.....	Jan. 5, 1900
BREESE, WILLIAM L.....	Dec. 7, 1889
BROKAW, L. W.....	Sept. 3, 1897
BROWN, JOHN CLIFFORD.....	Jan. 16, 1901
BROWNE, FRANCIS CHARLES.....	Jan. 9, 1900
BURNETT, LEONARD E.....	March 16, 1904
CAIRNS, JOHN S.....	June 10, 1895
CALL, AUBREY BRENDON.....	Nov. 20, 1901
CAMPBELL, ROBERT ARGYLL.....	April —, 1897
CANFIELD, J. B.....	Feb. 18, 1904
CARTER, EDWIN.....	——— 1900
CLARK, JOHN N.....	Jan. 13, 1903
COLBURN, W. W.....	Oct. 17, 1899
COLLETT, ALONSO M.....	Aug. 22, 1902
CORNING, ERASTUS, Jr.....	April 9, 1893
COE, W. W.....	April 26, 1885
DAFFIN, WM. H.....	April 21, 1902
DAKIN, JOHN A.....	Feb. 21, 1900
DEXTER, NEWTON.....	July 27, 1901
ELLIOTT, S. LOWELL.....	Feb. 11, 1889
FAIRBANKS, FRANKLIN.....	April 24, 1895
FANNIN, JOHN.....	June 20, 1904
FOWLER, J. L.....	July 11, 1899
GESNER, A. H.....	April 30, 1895
GOSS, BENJAMIN F.....	July 6, 1893
HATCH, JESSE MAURICE.....	May 1, 1898
HOADLEY, FREDERIC H.....	Feb. 26, 1895
HOOPES, JOSIAH.....	Jan. 16, 1904
HOWLAND, JOHN SNOWDON.....	Sept. 19, 1885
INGERSOLL, JOSEPH CARLETON.....	Oct. 2, 1898
JENKS, JOHN W. P.....	Sept. 27, 1894
JESURUN, MORTIMER.....	March —, 1905
JOUY, PIERRE LOUIS.....	March 22, 1894
KNIGHT, WILBUR CLINTON.....	July 8, 1903
KNOX, JOHN C.....	July 9, 1904
KNOX, JOHN COWING.....	June 1, 1904
KUMLIEN, LUDWIG.....	Dec. 4, 1902
KUMLIEN, THURE.....	Aug. 5, 1888
LAWRENCE, ROBERT HOE.....	April 27, 1897

Deceased Members.

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LINDEN, CHARLES.....	Feb. 3, 1888
MAHRETT, GIDEON.....	Aug. 15, 1900
MARBLE, CHARLES C.....	Sept. 25, 1900
MARCY, OLIVER.....	March 19, 1899
MARIS, WILLARD LORRAINE.....	Dec. 11, 1895
McKINLAY, JAMES.....	Nov. 1, 1899
MEAD, George S.....	June 19, 1901
MINOT, HENRY DAVIS.....	Nov. 13, 1890
MORRELL, CLARENCE HENRY.....	July 15, 1901
NICHOLS, HOWARD GARDNER.....	June 23, 1896
NIMS, LEE.....	March 12, 1903
NORTHROP, JOHN I.....	June 26, 1891
PARK, AUSTIN F.....	Sept. 22, 1893
RAGSDALE, GEORGE H.....	March 25, 1895
READY GEORGE.....	March 20, 1903
RICHARDSON JENNESS.....	June 24, 1893
SELOUS, PERCY SHERBORN.....	April 7, 1900
SLATER, JAMES H.....	Feb. —, 1895
SLEVIN, THOMAS EDWARDS.....	Dec. 23, 1902
SMALL, EDGAR A.....	April 24, 1884
SMITH, CLARENCE ALBERT.....	May 6, 1896
SOUTHWICK, JAMES M.....	June 3, 1904
STOWE, W. H.....	March —, 1895
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